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ABSTRACT

Volume IV of a four volume report on the results of a national study of the Upward Bound (UBO and Educational Talent Search (ETS) programs focuses on Upward Bound itself. The first three chapters provide a general descriptive background to the study, its design and limitations. The next four chapters focus on: (1) characteristics of the UB staff, (2) characteristics of UB projects, (3) perceptions of UB by participating students, (4) student outcomes as a function of UB participation, and, (5) student outcomes as related to project characteristics. Findings of the evaluation include the following (1) UB does not appear to represent a single intervention treatment, or even two or three clearly delineated treatments; pursuit of the general objectives of the UB program appear to be common across projects, but particular programmatic emphases and assumptions relative to the attainment of the general objectives showed considerable variation among projects; (2) projects appear to be adequately staffed, with individuals of acceptable levels of formal training and experience for their positions; (3) although the overall program exhibits considerable variability, particularly in the academic component, UB seems to be effective in providing and delivering the basic activities required by the guidelines; (4) students involved in the UB projects appear positive about staff and their program experience; and, (5) projects appear to be compatible with and an integral and accepted part of their host institutions. (Author/AM)

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FINAL REPORT

22U-889

A STUDY OF THE NATIONAL UPWARD BOUND AND TALENT SEARCH PROGRAMS

VOLUME IV

EVALUATION STUDY OF THE UPWARD BOUND PROGRAM

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U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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EDUCATION

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PREFACE AND ACKNOWLEDGEMENTS

A Study of the National Upward Bound and Talent Search Programs, the final report of the research conducted by the Research Triangle Institute under USOE contract number OEC-0-73-7052, is presented in four volumes:

Volume I, *Review of the Literature Relevant to Upward Bound and Talent Search Programs*.

Volume II, *Estimates of the Target Population for the Upward Bound and Talent Search Programs*.

Volume III, *Descriptive Study of the Talent Search Program*.

Volume IV, *Evaluation Study of the Upward Bound Program*.

The authors, in preparing Volume IV of this report, wish to express their special appreciation for the cooperation and contributions of a number of people both within and outside the Research Triangle Institute (RTI).

Valuable, thorough, and constant professional guidance was provided throughout the course of the study by the project officer for USOE, Dr. Robert Berls, of the Office of Planning, Budgeting, and Evaluation (OPBE), and Dr. Sal B. Corrallo, Director of the Postsecondary Programs Division, OPBE.

The following members of the Upward Bound/Talent Search Advisory Council made valuable contributions to the overall design of the study and also aided in reviewing and revising this report. (The organizational affiliations of Advisory Council members and of the other consultants listed in subsequent paragraphs are presented in Appendix A): Dr. David Ballesteros, Mr. Marcus Bell, Dr. Robert Berls, Ms. Lois J. Carson, Mr. Alan Clarke, Dr. Sal B. Corrallo, Mr. David Johnson, Dr. John Rison Jones, Ms. Rosalia Martinez, Mr. Walter Mason, Mr. Grayson Noley, Mr. Alexis Poliakoff, Mr. Silas Purnell, Ms. Janis Sanchez-Hucles, Mr. Frank Sandage, Ms. Faith Spotted Eagle, Mr. Rudy Tamez, and Dr. Stephen J. Wright. In addition to their involvement as Advisory Council members, Mr. Noley and Dr. Ballesteros were members of Upward Bound site visit teams.

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Executive Summary

Evaluation Study of the Upward Bound Program

Volume IV of
A Study of the National Upward Bound
And Talent Search Programs

I. BACKGROUND AND PURPOSE

Under authority of the Economic Opportunity Act of 1964, as amended (42 U.S.C. 2809), the Office of Economic Opportunity (OEO) funded 17 Upward Bound (UB) projects as a pilot program in the summer of 1965. In 1966, UB was authorized as a national program under Title II-A of the Economic Opportunity Act. On July 1, 1969, responsibility for the program was transferred from OEO to the U.S. Office of Education (USOE), Department of Health, Education, and Welfare (HEW). Currently, UB is authorized under section 408 of the Higher Education Act of 1965, as amended (20 U.S.C. 1068).

UB was designed to reach low-income high school students who have potential for successfully completing a postsecondary education program but who, due to inadequate preparation or lack of motivation, are prevented from seeking higher education or from meeting conventional criteria for admission to a college, university, or technical institute. Through the use of remedial instruction, exposure to new or altered curricula, tutoring, cultural enrichment, and counseling, the program is designed to generate in such individuals the skills and motivation necessary to enter and successfully complete postsecondary education.

During the summer, UB students typically reside on a college, university, or secondary school campus for an intensive six to eight week session, taking courses, attending cultural and social events, and receiving counseling. In the academic year, they typically receive less intensive attention: they may attend Saturday classes, attend periodic tutorial/counseling sessions, or participate in occasional cultural enrichment activities. During their junior and senior years of high school, they receive guidance in exploring options for postsecondary preparation and the program best suited to their needs.

In July 1973, USOE awarded the Research Triangle Institute (RTI) a contract (OEC-0-73-7052) to plan and conduct an evaluation of the UB and Talent Search (TS) programs. Several sources were consulted in designing the study, including the enabling legislation, the official guidelines, selected program personnel, current and former UB staff personnel and students, and three study advisory panels. The planning study was conducted from July 1973 to January 1974; the actual studies were implemented and conducted from February 1974 to March 1976.

The primary goal of the RTI study was to evaluate two of the program's major objectives: (1) to increase the high school retention rate of its participants and (2) to increase the rate of entry of its participants into postsecondary institutions. Evaluation of the legislatively mandated objective--attainment of skills and motivation necessary for postsecondary success--was a secondary goal of the study, primarily because of practical problems involved in determining and measuring the nature and degree of such skills and motivation. Another secondary study goal was to provide a detailed national description of the UB program, including characteristics of the staff and students, their perceptions of the program, and project operations and costs. A final study goal was to examine project characteristics in relation to attainment of program objectives.

II. METHODOLOGY

The study utilized a quasi-experimental design in which a sample of UB students and comparison students were followed through a short period of time. The design was basically cross-sectional, with the collection of some retrospective and short-range longitudinal data.

Multi-stage probability sampling techniques were employed. Of the UB projects operating in the United States during the 1973-74 program year, 54 were selected after stratification on student ethnicity, number of students served, project location, project emphasis, and type of host institution. All participants in the sampled project who were in grades 10, 11, or 12 were selected, yielding 3,710 UB students in the final sample. The comparison population was defined as students in the same grade levels and high schools as the UB students. For each selected UB project, an average of two high schools providing students to that project were selected. From sampled classrooms in each of these schools, a total of 2,340 comparison students (about 21 per sampled school) were selected after stratification on grade level, ethnicity, low income status, and academic risk. The final sample of UB project staff included project directors from all 54 selected projects and a sample of 104 counselors and 211 instructors. Also, 15 of the 54 sampled UB projects were selected for site visitation.

Data were collected through questionnaire responses, interview responses, and student records. Very low return rates were experienced with only one student questionnaire which was directed to dropouts who were difficult to locate and probably less motivated to respond. In total, over 98 percent of students in both the UB and comparison groups responded to at least one questionnaire. The minimum return rate for staff questionnaires was 73 percent for UB instructors. Complete staff data (i.e., questionnaires returned by all sampled staff in a project) were available for only one-third of the projects sampled, but in about 70 percent of the projects, questionnaires were available from the project director and from at least half of the sampled counselors and instructors. In all, the extent of indeterminate data for returned questionnaires had no serious impact on the analysis.

For analyses, sampling weights were used where feasible in computing the various statistics as unbiased estimates of population parameters. Weight adjustments were made for both item and instrument nonresponse. To evaluate the attainment of basic UB objectives, a series of analyses focused on comparative student outcomes of UB participants and comparison students. Differences between these populations on such factors as grade level, sex, race, academic risk, poverty status, and general region, state, district, or school-specific educational environments were reduced by the sample design or by a posteriori statistical adjustment of the comparison group's indices.

III. SUMMARY AND INTERPRETATION OF MAJOR FINDINGS

A. Attainment of Basic UB Objectives

1. Increasing the Rate of High School Completion

Fall-to-spring high school continuance rate within each of grade levels 10, 11, and 12 is slightly higher for the UB group than for the comparison group--significantly so for grades 10 and 11. Regardless of grade level considered, however, these continuance rates for both groups were quite high, ranging from 93 to 98 percent. Within the UB group, fall-to-spring continuance rates for twelfth graders tended to increase with the length of time students had spent in the UB program. Fall-to-fall high school continuance rates are lower for both groups, ranging from 85 to 93 percent. The only statistically significant fall-to-fall rate difference was for grade 10, in which the UB students showed higher rates (93 percent versus 86 percent). Further, these rates do not appear to be related to the extent of UB participation. These analyses do not indicate that the UB program is significantly increasing high school completion among its participants. For UB and similar students, the estimated probability of completion of any given high school grade is high (85 percent or above); the estimated probability of completing the twelfth grade, for a student who enters the tenth grade is about 70 percent, regardless of UB participation.

2. Increasing the Rate of Entry Into Postsecondary Education (PSE)

Among high school graduates, 47 percent of the comparison students entered PSE as compared to 71 percent of the UB participants. Among all individuals who could have entered PSE (i.e., those not still in high school, including dropouts), 65 percent of UB students entered PSE as compared to 43 percent of comparison students. There is also evidence that among high school graduates, PSE entry rate is positively related to length of participation in the UB program. That is, 78 percent of the students who had participated in UB in grades 10 through 12 entered PSE, 69 percent of the students who had participated in UB in grades 11 and 12 entered PSE, and 68 percent of the students who had participated in UB only in grade 12 entered PSE. Of those UB students entering PSE institutions, about 75 percent enrolled in four-year colleges or universities, about 20 percent entered two-year junior or community colleges, and the remaining students entered vocational, trade, or other schools; comparable figures for the comparison group were about 45, 30, and 25 percent, respectively.

Given these results, it appears that UB participation is positively related to immediate entry into PSE. A plausible explanation for this relationship (though not the only one) is that UB program participation raises the probability of student entry into PSE.

3. Generating Skills and Motivation Necessary for Success in Education Beyond High School

Analyses indicated the UB program helps students in preparation for PSE, including the applications process. The data further indicated that proportionally more UB than comparison students apply for financial aid. Although UB aid applicants do not receive more offers of aid, they do receive more adequate offers, generally in the form of larger grants. There was no apparent relationship between UB participation and changes in academic measures from ninth grade to current grade in terms of grade point average, proportion of academic credits taken, and academic credits passed. There is evidence, however, that greater proportions of UB participants planned and expected to attend and complete PSE. These results suggest that the UB program is providing supportive, advocacy, and advisory services that facilitate entrance to PSE.

4. Student Evaluations of UB Projects

Students involved in the UB projects appear positive about the staff and their program experience. The quality of the curriculum, of counseling, and tutoring, and of overall administration is perceived to be quite high, as is the pattern of staff and student interrelationships. The self-reports of the students strongly suggest that they are incorporating program objectives into their own behavior, self-concept, and aspirations. The average ratings of academic year program elements were slightly lower than those of comparable elements in the summer program. Students perceived the UB program's central functions and such day-to-day operations of teaching, counseling, and administration to be well conducted and organized. They considered the best qualities of the program to be the staff's interest in the students and the harmonious relationships among the staff and among the students. They also prized highly the staff's willingness to accept student suggestions. Of the potential benefits attainable from UB participation, students rated gaining a better understanding of the need for education and being prepared to gain admission to college or other types of schools as being most important. At the same time, not all students find all project activities helpful.

B. Characteristics of UB Projects, Staff, and Students

A major finding, supported by the site visits and the analyses of questionnaire responses, is that UB does not appear to represent a single intervention, or even two or three clearly delineated interventions. Variation, rather than commonality, was the salient aspect of program description for most of the dimensions considered. Within the general limits established by program guidelines, projects varied extensively in the kinds of students served and the ways in which specific intervention strategies were implemented. Pursuit of the general program objectives appeared to be common across projects, but particular objectives and emphases given them showed considerable variation among projects.

1. Project Costs

In the program year from 1 July 1973 to 30 June 1974, 416 UB projects reported serving 51,755 clients at a cost of $38.3 million. Of the 416 projects, 67 served approximately 12,200 veterans and 9 special demonstration projects served approximately 980 students. The estimated average yearly total cost per project (excluding in-kind contributions) was $111,986 for the 1973-74 program. For the 1973 summer program, the estimated cost was $63,769 per project or approximately $830 per student served; for the 1973-74 academic year program, the estimated average cost was $51,863 or approximately $700 per student served. Over 90 percent of these monies were contributed by federal sources. There was considerable variation in the cost figures reported for projects. The range of reported total costs, excluding in-kind contributions, was from $9,792 to $175,000 during the summer program and from $19,500 to $134,000 during the academic year. Nonfederal support ranged from $0 to well over $100,000, with the preponderance of projects reporting no nonfederal funding. Projects reported receiving an average of $9,149 worth of in-kind contributions, such as office space, facilities, and personnel services, although these estimates are suspected to be low.

Examinations of project costs and project characteristics indicated the number of students served was positively related to total project costs. These results are not surprising as project funding is determined by a formula which accounts for the number of students to be served. No factors were observed that would suggest institutional or urban-rural inequities in funding.

2. Project Activities and Services

A wide range of courses and classes, tutoring and counseling services, sports, social and cultural activities, and medical and dental services were offered by projects during both the summer and academic year programs. Tutoring and counseling services were generally offered by all projects during both sessions, but there was greater variability in the availability of other activities. A greater variety of courses seemed to be available during the summer program than during the academic year. The activities most commonly available were also characterized by the highest participation rates among those students for whom the activities had been available, and these activities were considered to be the most helpful among the students who had participated. Although the overall program exhibits considerable variability--particularly in the academic year component--UB seems to be providing and delivering the basic activities required by the guidelines.

3. Relations with Host Institutions and Other Supporting Groups

UB staff reported receiving at least moderately effective support from their host institutions, their advisory committees, and other parent and community groups. The staff and students reported good relationships among themselves, suggesting that in most projects the directors, staff, and students formed a highly cohesive group. Almost all of the project directors rated their host institutions (primarily public and private colleges and universities) as being supportive. Evidence of host institution support and commitment to specified projects, and to the UB concept in general, was also obtained in site visits. Directors reported cooperative relationships with other programs for the disadvantaged which operated in their areas (both those administered by the same host institution and those administered by other institutions). UB instructors and counselors also reported receiving a high degree of cooperation from high schools and PSE institutions. Such cooperation is important since UB projects typically depend on high schools for recruiting students, providing school records, and developing complementary programs of study for students. Additionally the projects depend on PSE institutions for processing applications, granting admission, administering financial aid, and providing for the needs of students in the institutions. Many project directors interviewed during site visits felt the need for more assistance, monitoring, feedback, and direction than they were currently receiving from the central and regional offices of USOE. A common concern across projects and regions was the timing of notification of funding and consequent late funding.

4. Project Staff

On the average, the projects were staffed by one and one-half full-time equivalent (FTE) administrative employees and three FTE support staff during both the academic year and summer programs. The major staffing difference between the two program components was for instructors and counselors, with an average of 4.3 of these service delivery employees during the academic year and 11.5 during the summer program. There was considerable variation about these average staffing profiles, but no significant associations were found to exist between project staffing patterns and other project characteristics.

Most staff members were young (age 35 or less). Nearly all project directors, and over half of the instructors and counselors, were male. The greatest proportion of project directors were black, while the greatest proportion of instructors and counselors were white. Projects appeared to employ staff of the same ethnicity as the student participants, though not always in the same proportions. Most of the staff had obtained at least a bachelor's degree, with slightly more than half having obtained a degree at the master's level or higher. In general, the course work and training completed by the UB project staff appeared directly related to their job needs. Over a third of the staff reported current participation in continuing education, and over half had attended workshops on teaching, counseling, or program administration for disadvantaged students. In addition to formal training and education, UB project staff generally had considerable practical experience in their field of work, but less experience working specifically with disadvantaged students.

All staff members, including project directors, performed a number of activities in common, principally, teaching and counseling. Most staff members appeared to be carrying reasonable work loads, and to be directing their energies efficiently. Instruction tended to be oriented toward group discussion or individualized instruction, and competition was deemphasized.

There was an extremely high degree of agreement in the ratings of educational goals by project directors, counselors, and instructors. In general, the staff agreed that the more important goals of education were developing student enthusiasm for learning, helping students to feel important, and providing students with a solid grasp of fundamental skills. Instructors rated the following behaviors to be most important in their teaching: encouraging students to become involved, giving students praise and affection, answering student questions, encouraging students to make choices, and diagnosing individual learning problems.

5. Recruitment and Characteristics of Students

UB students most frequently reported first hearing about the program from other UB students. Other sources from which substantial proportions of students first heard of the program were school guidance counselors, UB staff members, and school teachers. These results support observations that formal student recruitment was carried out in most projects by "contact counselors" in the feeder high schools. Responsibility for the final selection of students, using various criteria but generally considering factors such as family income, grades and aptitude test scores, teacher and counselor recommendations, evidences of student motivation, and personal intuition, was assumed by UB project directors and staff.

About 51 percent of the UB students were black; 18 percent were white; and 20 percent either American Indians, Mexican Americans, Puerto Ricans, or Orientals. Approximately 56 percent of UB students were female. Approximately 85 percent of the students were 16 to 18 years of age; and approximately 15, 39, and 45 percent were in grades 10, 11, and 12, respectively. Based on ninth grade academic information which was typically prior to UB participation, slightly more than half of the UB students were classified as "academic risks." On an index that is closely related but not identical to federal poverty-level guidelines, approximately two-thirds of the UB students were considered to be at or below poverty level. About one-half the parents of UB students had attained a formal education equivalent to or greater than a high school diploma. UB students were seen by directors, instructors, and counselors as most proficient in peer relations and creativity. General academic ability of students was rated to be above average by all staff. The lowest ratings were given to student attitudes toward authority and toward school, self-concept, and attention span.

Although most UB students appeared to be the kind for whom the program is intended, the definition of the target group with regard to potential for academic achievement appeared to vary because of lack of specificity, operational feasibility, or differences in interpretation among staff in various projects. Some of the resulting differences in the UB participants among projects may represent a desirable heterogeneity, but this heterogeneity appears to result from variability in personal convictions or preferences of project staff or from lack of precision in definitions specified in the legislation and guidelines. This is not to state that ineligible or undeserving students are being served, but that a variety of kinds of disadvantagement are probably now represented in different projects.

C. The Relationships of Student Outcomes to Project Characteristics

The relationships of project characteristics with average student outcomes for the project sites were analyzed. Poverty status, grade-point average in the ninth grade, academic risk, sex, and similar pre-UB measures of student characteristics had strong relationships with outcome measures such as PSE entry rates, changes in grade-point averages, and types of PSE entered. Relationships between outcome measures and UB staff characteristics, types of instruction, counseling, and tutoring were examined, after adjustments for pre-UB measures and some weak relationships were found. The basic finding suggests that projects with lower proportions of academic risk and/or poverty level students are more likely to achieve the basic goal of inducing or experiencing high PSE entry rates. This relationship does not provide particularly useful information for program-level decision making, since any project can determine, through selection procedures, the academic and economic nature of participants (within the constraints of the program guidelines).

Generally, the analyses did not discover any systematic set of UB project characteristics related to success. A possible explanation of this pattern of findings, which is supported by observations during site visits, is that different approaches are used by UB projects because different types of students are selected, and that different students are selected because a UB project has geared its approach to that particular type of student. With this explanation, statistical adjustments for input differences, such as those used in these analyses, would tend to cancel any effects due to a UB process. This explanation is quite consistent with the study findings, but to investigate the hypothesis more fully would require different approaches to both design and measurement than those employed in this study.

Chapter 1

Introduction

I. GENERAL

This volume constitutes the fourth of a four-volume report entitled A Study of the National Upward Bound and Talent Search Programs.[1/] The volume describes the results of an evaluation study of the Upward Bound (UB) Program--a nationwide program funded by the U.S. Office of Education (USOE) to help selected low-income high school students prepare for and enter postsecondary education. The study, conducted by the Research Triangle Institute (RTI), was funded by the Office of Planning, Budgeting, and Evaluation (OPBE) of USOE (contract number OEC-0-73-7052).

Under the same contract, another federally funded program, Talent Search (TS), was also studied. The results of the TS evaluation and other companion studies are reported in the first three volumes. Volume I provides a Review of the Literature Relevant to Upward Bound and Talent Search Programs. Volume II provides Estimates of the Target Populations for the Upward Bound and Talent Search Programs. Volume III reports the results of the Descriptive Study of the Talent Search Program.

This chapter describes the UB program, presents an overview of the development of the UB study design, and outlines the organization of the remainder of Volume IV. Appendices of supporting documents and information for Volume IV have been bound separately.

II. BACKGROUND

The UB program originated in the Office of Economic Opportunity (OEO) from pilot demonstration projects that operated in the summer of 1965. In 1966, it was authorized as a national program under Title II-A of the

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[1/] A Study of the National Upward Bound and Talent Search Programs. Final Report 22U-889, Four Volumes. Research Triangle Park, North Carolina: Research Triangle Institute, April 1976.

Economic Opportunity Act. In 1968 the Higher Education Amendments transferred the UB program from the Office of Economic Opportunity to the U.S. Office of Education. The present legislative authority for the UB program is the Education Amendments of 1972 (Public Law 92-318).

UB was designed to reach low-income high school students who have potential for successfully completing a postsecondary program but who, due to inadequate preparation or lack of motivation, are prevented from seeking higher education or from meeting conventional criteria for admission to a college, university, or technical institute. Through the use of creative remedial instruction, exposure to new or altered curricula, tutoring, cultural exposure, and encouragement, the program is designed to generate in such individuals the skills and motivation necessary to enter and successfully complete postsecondary education.

During the summer, UB students typically reside on a college, university, or secondary school campus for an intensive 6- to 8-week session, taking courses, attending cultural and social events, and receiving counseling. In the academic year, they typically receive less intensive attention; they may attend Saturday classes, attend periodic tutorial/counseling sessions, or participate in occasional cultural enrichment activities. During their junior and senior years, they receive encouragement and guidance in exploring many options for postsecondary preparation and the program best suited to their needs.

Institutions sponsoring UB projects typically are 2- or 4-year colleges; in some cases, projects are sponsored by secondary schools or cooperating groups of institutions. The 1968 Higher Education Amemdments required projects to (a) establish cooperation between postsecondary institutions and secondary schools, (b) provide health services for program participants, (c) provide each student a stipend of no more than $30 per month, and (d) establish a maximum cost-per-student of $1,800 per year, with the Federal share of expenditures limited to a maximum of 80 percent or $1,440 per student. The Education Amendments of 1972 removed these requirements except for the ceiling on student stipends, increasing the Federal share of program funding to 100 percent.

During fiscal year 1973, or program year 1973-1974, there were 416 UB projects operating in the United States and its territories. The UB data bank reporting system indicates that these projects served 51,755 individual participants[2] at a cost of $38.3 million during that period. Of the 416 projects, 67 were created specially for veterans, serving approximately 12,200 of them in FY 1973, and 9 were special demonstration projects which served approximately 980 students in FY 1973, according to the UB data system. The present study involved only the 333 regular UB projects (not the Special Veterans or demonstration UB projects) operating in the coterminous United States during FY 1973.

The present study was deemed necessary by USOE for several reasons. Past studies of the program have been inadequate in some respects and are, in most cases, out of date. Some evaluative studies of UB have been undertaken in the past; however, the majority of such studies have been at the project level (see Volume I of this series of reports). Many such studies have been discounted as "advocacy studies." Although the USOE maintains a data bank of information about current and former UB participants, this system is considered inadequate to provide a current, comprehensive evaluation of the program. Standard available system software is focused on providing project-by-project or aggregate statistics (at various levels of aggregation), but this data source and the related software were neither intended nor designed to provide data to the extent required for a comprehensive evaluation of the program.

The UB program was subjected to a rather comprehensive review in 1969 by Greenleigh Associates, Inc., under contract to the OEO.[3] The Greenleigh study, however, did not meet present needs in that: (a) the evaluation was conducted at an early point in the history of the program, reflecting its operation at that time through the OEO (substantial program changes have been subsequently made, including transfer to the Division of Student Support and Special Programs (DSSSP) of USOE, changes in legislation, and regionalization of program direction); (b) it was not possible to observe the long-term effects toward retention of UB alumni in higher education; and (c) certain inadequacies existed in the control groups employed.

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[2] Due to participant turnover and the overlapping of project year with fiscal year, the number of participants being served at a given point in time would be considerably less than this figure.

[3] Greenleigh Associates, Inc. Upward Bound 1965-69: A History and Synthesis of Data on the Program in the Office of Economic Opportunity. New York: Greenleigh Associates, Inc., February 1970.

Another notable study of the UB program was recently conducted by the General Accounting Office (GAO).[4/] Though severely limited in scope (in both kinds of data employed and numbers of projects examined), this study nevertheless raised serious questions as to the relative effectiveness of the UB program and the validity of the information contained in the UB data file.

III. DEVELOPMENT OF THE STUDY DESIGN

In response to a request for proposals issued by USOE in May 1973, RTI submitted a proposal for the planning of a comprehensive study and evaluation of two programs, UB and TS. On acceptance of the proposal by USOE, RTI carried out the planning study during the period of June 1973 to January 1974. The actual studies of UB and TS were implemented subsequently, from February 1974 to March 1976.[5/]

This section discusses the procedures followed in formulating the UB study design during the planning phase, the constraints limiting the design, the resolutions of problems arising from these constraints, and the main features of the resultant design.

A. Procedures

The design of the study involved several iterative processes. The key aspects, however, can be summarized in four steps. The first major step in designing the study was to obtain a comprehensive and realistic understanding of the UB program from available existing data and past studies. This step included the formulation of a model of the UB program, presented below in subsection III.B. The second step involved determining specific objectives of the study and attendant constraints. The third step was designing

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[4/] Comptroller General of the United States. Problems of the Upward Bound Program in Preparing Disadvantaged Students for a Postsecondary Education. Washington, D.C.: U.S. Government Printing Office, March 1974.

[5/] The present series of reports describe the results of these studies; this volume reports the results of the UB study.

alternative studies and estimating for each alternative the degree to which it would meet the objectives and the level of effort and time it would entail. The last step was choosing a final design. Several sources of information and assistance were consulted in carrying out these steps.

In order to obtain a detailed understanding of the program and to devise alternative preliminary designs, several sources were employed: the published literature concerning UB; government documents providing the legislation and operating guidelines for UB projects; officials of the USOE, DSSSP, and OPBE; senior program officers in several USOE Regional Offices; and UB project staff and students. In addition, an advisory council was formed to review the UB model and the preliminary designs, and to help in the other steps of the design process.

The advisory council aided the research team by contributing its knowledge of UB projects, UB personnel, and educational programs for disadvantaged youths. It was composed of members of the educational community, personnel involved with UB and TS at the project and regional levels, and personnel from DSSSP and OPBE (see Appendix H for a list of members). The full council met three times during the planning study.

At the first meeting, which took place early in the planning study, the advisory council suggested some changes in the UB model, considered the preliminary study designs, and discussed with the RTI research team the primary objectives of the study and certain practical constraints in implementing any study.

After the first meeting, the RTI research team developed a series of alternative study designs, in light of the feedback from the advisory council. At the second advisory council meeting, near the end of the planning phase, these refined designs (ranging from a minimal cross sectional study of high school seniors to a 7-year longitudinal study) were examined and the council offered advice regarding their preferred designs.[6/] Subsequently, OPBE, in consultation with the RTI team and in consideration of the council's recommendations, selected the study reported in this volume (along with the other two studies reported in Volumes II and III).

[6/] The alternative designs are detailed in an unpublished working paper prepared for USOE entitled Talent Search and Upward Bound Evaluation Study, 12 November 1975.

In the final meeting during the planning phase, the council met to review the questionnaires and other instruments that had been developed by RTI for the study.

In addition to the advisory council, a student panel was formed to review the student questionnaires and study design. This panel was composed of former or current UB students or students otherwise involved in UB (membership of this panel is given in Appendix H).

In February 1974, the implementation of the chosen study began. During the course of the study, the advisory council was kept informed of progress by monthly newsletters. The council met for a final time in February 1976 to review the present report and to suggest modifications prior to its submission to USOE.

An additional advisory group was utilized during the implementation phase. This was a committee formed and convened by USOE to review the analysis plans for the present study[7] (see Appendix H for a list of members).

B. A Model of Upward Bound Processes and Effects

In planning the UB study, one of the first steps was to develop a conceptual scheme representing the UB processes and consequences, as well as other relevant factors to be considered in the evaluation.

The model, as depicted in Figure 1.1, represents in sequence[8] UB and related processes and outcomes. The boxes in page 1 of Figure 1.1 depict the procedures and conditions required for creating UB projects, including funding and staffing. Once projects have begun operations, they select students and offer a number of activities constituting the program treatment, as listed in the box labelled "Program Activities" (page 2 of Figure 1.1). These activities or treatments are intended to produce certain effects (page 3 of Figure 1.1), which are separated into those occurring: (1) during UB participation, "Immediate Effects"; (2) in the few (up to four)

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[7] The analysis plans were presented to the committee in a document entitled Report of Planned Analyses for Upward Bound Evaluation, Volumes I and II. Research Triangle Park, N.C.: Research Triangle Institute, November 1974.

[8] Figure 1.1 is presented on three separate pages; the sequential nature of the processes and outcomes is represented from left to right on a given page.

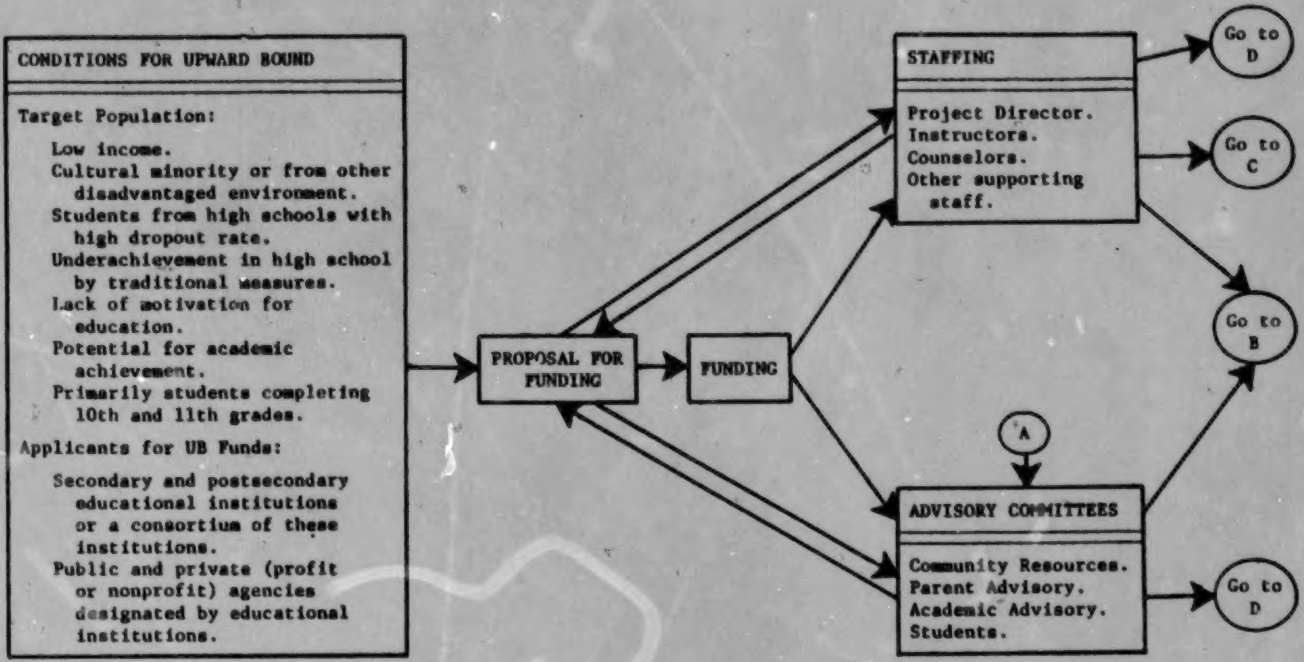

CONDITIONS FOR UPWARD BOUND
Target Population:
Low income.
Cultural minority or from other disadvantaged environment.
Students from high schools with high dropout rate.
Underachievement in high school by traditional measures.
Lack of motivation for education.
Potential for academic achievement.
Primarily students completing 10th and 11th grades.
Applicants for UB Funds:
Secondary and postsecondary educational institutions or a consortium of these institutions.
Public and private (profit or nonprofit) agencies designated by educational institutions.
PROPOSAL FOR FUNDING
FUNDING
STAFFING
Project Director.
Instructors.
Counselors.
Other supporting staff.
A
ADVISORY COMMITTEES
Community Resources.
Parent Advisory.
Academic Advisory.
Students.
Go to D
Go to C
Go to B
Go to D

Figure 1.1. A Conceptual Model of Upward Bound.

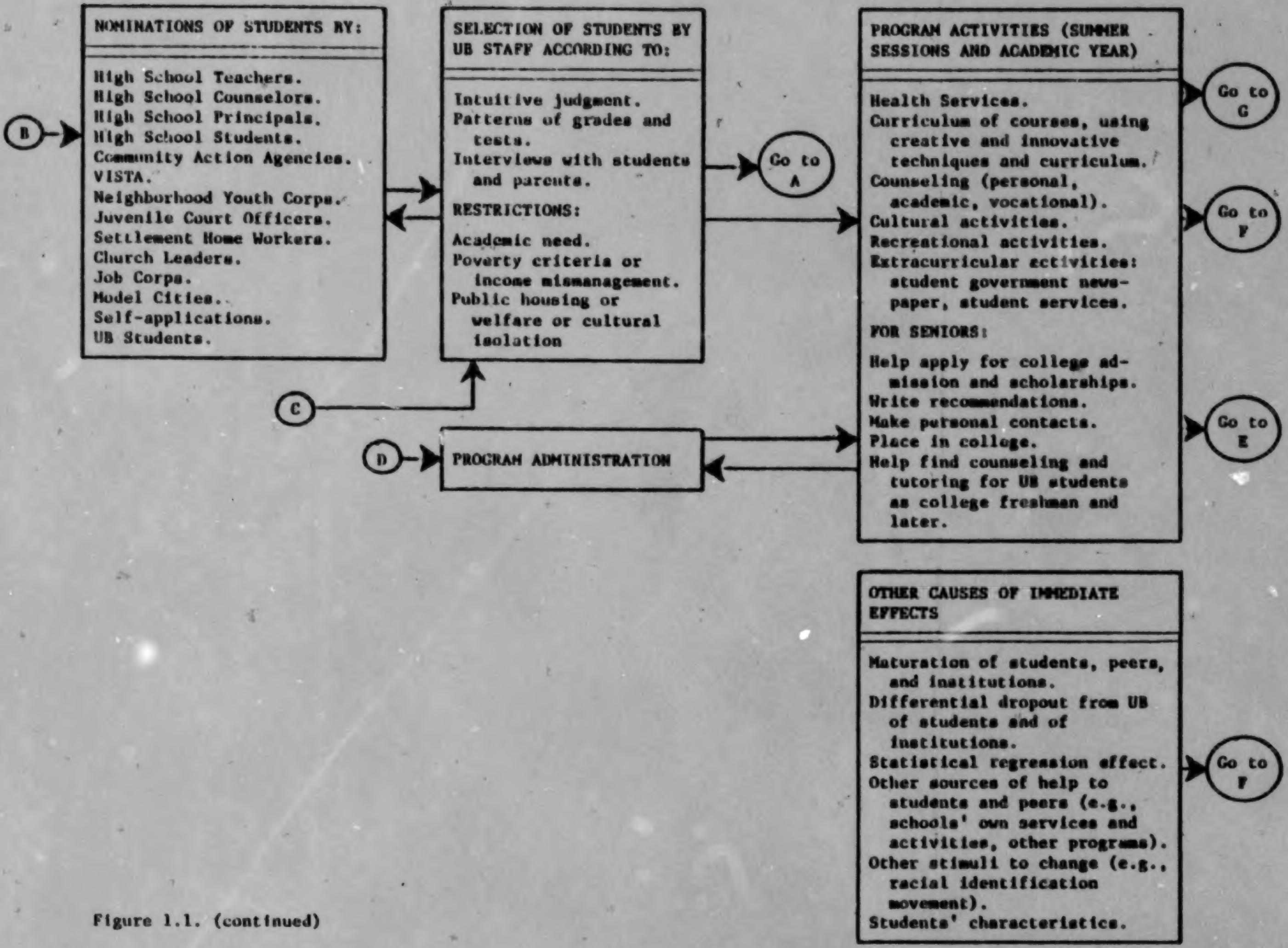
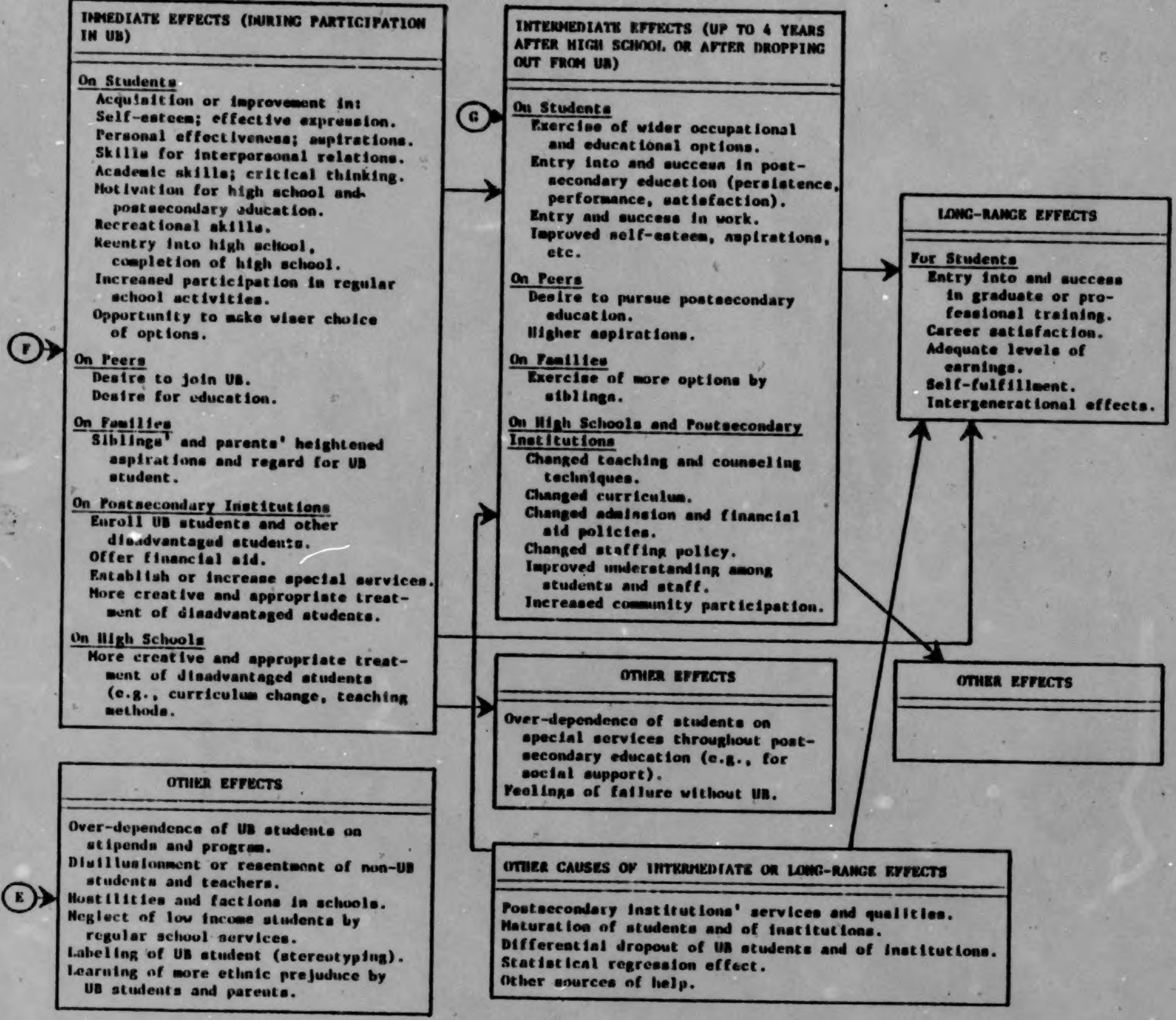

B
NOMINATIONS OF STUDENTS BY:
High School Teachers.
High School Counselors.
High School Principals.
High School Students.
Community Action Agencies.
VISTA.
Neighborhood Youth Corps.
Juvenile Court Officers.
Settlement Home Workers.
Church Leaders.
Job Corps.
Model Cities.
Self-applications.
UB Students.
SELECTION OF STUDENTS BY UB STAFF ACCORDING TO:
Intuitive judgment.
Patterns of grades and tests.
Interviews with students and parents.
RESTRICTIONS:
Academic need.
Poverty criteria or income mismanagement.
Public housing or welfare or cultural isolation
Go to A
C
D
PROGRAM ADMINISTRATION
PROGRAM ACTIVITIES (SUMMER SESSIONS AND ACADEMIC YEAR)
Health Services.
Curriculum of courses, using creative and innovative techniques and curriculum.
Counseling (personal, academic, vocational).
Cultural activities.
Recreational activities.
Extracurricular activities: student government newspaper, student services.
FOR SENIORS:
Help apply for college admission and scholarships.
Write recommendations.
Make personal contacts.
Place in college.
Help find counseling and tutoring for UB students as college freshman and later.
Go to G
Go to F
Go to E
OTHER CAUSES OF IMMEDIATE EFFECTS
Maturation of students, peers, and institutions.
Differential dropout from UB of students and of institutions.
Statistical regression effect.
Other sources of help to students and peers (e.g., schools' own services and activities, other programs).
Other stimuli to change (e.g., racial identification movement).
Students' characteristics.
Go to F

Figure 1.1. (continued)



IMMEDIATE EFFECTS (DURING PARTICIPATION IN UB)

On Students
- Acquisition or improvement in:
- Self-esteem; effective expression.
- Personal effectiveness; aspirations.
- Skills for interpersonal relations.
- Academic skills; critical thinking.
- Motivation for high school and postsecondary education.
- Recreational skills.
- Reentry into high school, completion of high school.
- Increased participation in regular school activities.
- Opportunity to make wiser choice of options.

On Peers
- Desire to join UB.
- Desire for education.

On Families
- Siblings' and parents' heightened aspirations and regard for UB student.

On Postsecondary Institutions
- Enroll UB students and other disadvantaged students.
- Offer financial aid.
- Establish or increase special services.
- More creative and appropriate treatment of disadvantaged students.

On High Schools
- More creative and appropriate treatment of disadvantaged students (e.g., curriculum change, teaching methods.

OTHER EFFECTS

- Over-dependence of UB students on stipends and program.
- Disillusionment or resentment of non-UB students and teachers.
- Hostilities and factions in schools.
- Neglect of low income students by regular school services.
- Labeling of UB student (stereotyping).
- Learning of more ethnic prejudice by UB students and parents.

INTERMEDIATE EFFECTS (UP TO 4 YEARS AFTER HIGH SCHOOL OR AFTER DROPPING OUT FROM UB)

On Students
- Exercise of wider occupational and educational options.
- Entry into and success in postsecondary education (persistence, performance, satisfaction).
- Entry and success in work.
- Improved self-esteem, aspirations, etc.

On Peers
- Desire to pursue postsecondary education.
- Higher aspirations.

On Families
- Exercise of more options by siblings.

On High Schools and Postsecondary Institutions
- Changed teaching and counseling techniques.
- Changed curriculum.
- Changed admission and financial aid policies.
- Changed staffing policy.
- Improved understanding among students and staff.
- Increased community participation.

OTHER EFFECTS

- Over-dependence of students on special services throughout postsecondary education (e.g., for social support).
- Feelings of failure without UB.

OTHER CAUSES OF INTERMEDIATE OR LONG-RANGE EFFECTS

- Postsecondary institutions' services and qualities.
- Maturation of students and of institutions.
- Differential dropout of UB students and of institutions.
- Statistical regression effect.
- Other sources of help.

LONG-RANGE EFFECTS

For Students
- Entry into and success in graduate or professional training.
- Career satisfaction.
- Adequate levels of earnings.
- Self-fulfillment.
- Intergenerational effects.

OTHER EFFECTS

Figure 1.1. (continued)

years after UB participation, "Intermediate Effects"; and (3) in the longer run, "Long-Range Effects". These intended effects may affect the UB students, their peers, or the secondary and postsecondary institutions involved. Besides these intended effects, the UB projects may also precipitate unintended results, some of which may be undesirable. These effects may occur at different time periods (the series of "Other Effects", page 3 of Figure 1.1). Finally, both the intended and unintended effects within each time period may be produced or moderated by causes other than UB, as seen in the boxes labelled "Other Causes" (pages 2 and 3 of Figure 1.1).

The model does not present the specific processes or treatments through which the program may produce the intended (or unintended) effects, since it was found early in the study that it was impossible to do this for the UB program as a whole. The various UB projects differ quite widely in their approach or program treatment. They provide different courses, using different classroom and tutoring techniques over varying periods of time; they employ different counseling techniques; and they place varying degrees of emphasis on the teaching of academic subjects and skills, the nurturing of the individual's ego strength, and the broadening of cultural and social experiences. In part, the diversity of treatments reflects the different types of students selected by different projects (some choosing students with very poor academic preparation and motivation, others selecting better prepared and more highly motivated students). The diversity also reflects the differing philosophies of various project directors and other UB personnel regarding compensatory education.

It was thus found that UB does not consist of a small number of identifiable treatment techniques with specified expected outcomes. Rather it was determined that in some general and unspecified manner the courses and tutoring offered by UB are expected to increase academic skills primarily, and self-concept and other personal strengths secondarily. Similarly, the individual attention, counseling, and cultural and social activities afforded by the program are intended to strengthen self-esteem and related personal qualities, and thereby to increase interest and ability to learn academically. For this reason, the model simply documents the variety of activities and their intended outcomes found across the range of UB projects.

Once the model was specified, it was used to help identify the components of the UB process which could be fruitfully evaluated, and to help identify factors that should be considered in designing a study. The model was thus the starting point from which several study designs were formulated. The primary objectives of the study and the considerations conditioning the eventual choice of a study design are treated below.

C. Objectives, Constraints, and Resolutions

Some constraints on design were imposed by the nature of the UB program; others were common to any attempt to evaluate an ongoing social action program which has been in operation for several years without a built-in mechanism for evaluation. Finally, there were time and budget limitations.

These constraints led to a number of key decisions that greatly influenced the study design. Some of the decisions were made exclusively by the RTI research team; others were made jointly with the advisory council and/or USOE. In considering the constraints and in finding ways to meet them, the RTI team was guided by a basic principle; namely, that the study must be designed to provide the most unbiased and scientifically accurate answers possible, within acceptable professional standards, to the questions defined to be of primary interest.

The mandated objective of the UB program is to provide participants with the skills and motivations necessary for success in education beyond high school. From this mandate, it was determined two other objectives were implied, and the three major objectives of the UB program were considered to be: (1) to increase the high school retention rates of its participants (or decrease their dropout rates from high school); (2) to increase the rate of entry of its students into postsecondary institutions; (3) to generate the skills and motivation necessary for success in education beyond high school. The RTI team and the advisory council jointly selected the first two major objectives as the primary focus for the study. Evaluation of the third major objective was not given equal priority for reasons explained in subsection III.C.3 below. Specific questions and subobjectives to be addressed by the study were defined during the design phase, and are described in Chapter 3. The major design elements and the constraints which influenced their adoption are discussed in the following subsections. The actual design is presented in detail in Chapter 2.

1. Choice of a Quasi-Experimental Design

The RTI research team and the advisory council concurred that an experimental design was not possible. In an experimental design, students eligible for UB would be randomly assigned to participate in the UB program or to a control group. Both the experimental UB group and the control group would be observed for given periods of time to determine the effects of program participation. Such a design would be ideal for determining whether UB was having an effect on its participants (e.g., on their rates of high school retention and entry into postsecondary education) but for many practical reasons was not feasible.

The RTI team also determined that it was not feasible to use a natural design in which groups receiving different types of UB treatments would be compared. As explained in subsection III.B above, students served by different projects differed on many dimensions due to selection criteria; also, the different treatments given by different projects were not systematic or well defined.

For these reasons, the RTI team concluded that the best alternative among the remaining options was a quasi-experimental design in which a sample of UB students and a sample of comparison students (CS) would be studied through a short period of time.

2. Choice of Cross-sectional Design

It was necessary that the USOE receive the results of the UB study no later than the end of 1975. Additionally, funds for the study were limited. For these reasons, a complete longitudinal study, favored in theory by all parties involved in planning, was not possible. The proposed longitudinal study would require observing UB students and appropriate comparison groups in high school and following them through their scheduled date of completion of four years of postsecondary education. This approach would not have produced results soon enough to satisfy USOE requirements. Further, such a study would have necessitated base year observations of a larger number of students than were used (to provide for adequate numbers of future observations). Funds were not available to cover a study of such scope.

Because a longitudinal design was not feasible, a cross-sectional approach was selected. In the chosen design, samples of a cross-section of participating UB students and appropriate comparison students were to be studied at a given point in time to collect retrospective and current data. The students were also to be followed over a short time period to determine whether they persisted in school. The chosen design posed both problems and advantages which are discussed in detail in Chapter 2. The cross-sectional approach did, however, allow answers to the major questions within the time limits required by USOE. It also required smaller samples and was thus less costly. The study was planned, moreover, so that it would be possible to expand it in the future into a limited longitudinal study.

3. Choice of Study Objectives

It was explained above that the third major objective of UB was not made a major study goal. Several reasons led to this decision. The third major UB objective (and the one mandated in current legislation) is "to generate the skills and motivation necessary for success in education beyond high school." Neither the literature, the advisory council, nor consultants, were able to define what constituted the requisite "skills and motivation" or how they were to be measured. The research team had considered administering standardized reading tests to obtain measures on a basic skill that is needed by persons of any ethnic background to acquire a postsecondary education in the United States. In addition, certain standardized aptitude and achievement tests that were less culture-bound were considered as methods of measuring some skills that are generally considered helpful in acquiring postsecondary education. The advisory council strongly advised against these considerations, pointing out that the use of any kind of test would gravely jeopardize the cooperation of the UB students in the study and would cause some of the CS group to refuse to participate, since both groups of students tend to fear and resent any kind of standardized test. Thus the decision was made to exclude the administration of tests from the study. The study would, therefore, rely on obtaining from school records the school grades, course information, and test scores it would need to determine the changes that occurred over the years among the sample students.

Another reason that the third major UB objective was not designated as a primary study goal was that time and funds were not available for a longitudinal study (see subsection III.C.2 above). One measure of whether the third objective was being fulfilled would have been to determine whether (with other relevant factors controlled) UB students in fact enter and complete postsecondary education at higher rates than an appropriate comparison group (although this technique would have examined possession of "sufficient" rather than "necessary" skills and motivation). Without a longitudinal study and investigation of the third major objective, the study is limited to examining some of the "Immediate Effects" of Figure 1.1.

Given time and budget limitations, it was further decided that, among the various immediate effects the research should concentrate on the study of the impact of UB on UB students. Thus, the study of the possible effects of UB on the peers and family of the UB students, and on the high schools and postsecondary institutions, were given low priority. Although the final research design, as presented in Chapter 2, did allow the study of other aspects of the UB process besides students, the study of the national impact of UB on its students was set as a first priority. This required national samples of UB and comparison students.

4. Choice of Measurement Methods

Because of the prohibitive cost of interviewing and other more direct methods of measurement for large numbers of subjects, written questionnaires were chosen as the primary instruments of data collection. School records and other supplementary methods of data collection were also used, as detailed in Chapter 2.

As an aid in obtaining data of greater depth and breadth than can be collected from the basic questionnaire approach, site visits were conducted at a subsample of UB projects. These site visits also served to familiarize members of the RTI research team with the day-to-day operational aspects of UB in action.

IV. ORGANIZATION OF THIS VOLUME

Although the procedures followed and analyses performed during the course of this study constituted an integrated sequential process, the remainder of this volume is organized into more or less discrete aspects of the study. Chapters 2 and 3 provide basic methodological considerations; Chapters 4, 5, and 6 describe the UB projects, staff, and students; and Chapters 7 and 8 present the results of the evaluative analyses. The entire study is summarized in Chapter 9. The information presented in subsequent chapters can stand alone in some sense, but the integrated nature of the analyses and procedures should be kept in mind. Different audiences will, of course, be interested in different aspects of the study. An outline is presented below to guide readers to appropriate chapters in which specific topics are addressed. As an additional aid to the reader, each subsequent chapter is concluded with a summary of major points and/or findings, in addition to the final summary chapter. Some readers may find it valuable to first read chapter summaries as an overview of the material presented in the chapter. The critical reader should, however, be fully aware of the intricacies and limitations of the study design and data manipulations and of the basic analysis strategies (Chapters 2 and 3) before proceeding to the remainder of the report.

With the exception of Chapters 3, 7, and 8, the presentation of results is relatively nontechnical. When specific analytic techniques are mentioned, they are briefly described or explained either in the text or in a footnote, and professional references are cited. For the more technically minded reader, details are provided in a set of appendices which are bound separately for this volume and which are outlined below.

Chapter 2 presents a relatively nontechnical detailed description of the final study design and methodology. The chapter contains descriptions of (a) the instrumentation for the study, (b) the procedures followed for data collection and preliminary data processing, (c) the development of data bases for analysis, and (d) techniques of data processing employed to prepare the data for analysis.

Chapter 3 provides an overview of the analyses presented in subsequent chapters and a discussion of limitations of the study, including a thorough analysis of data quality. The analyses presented in this chapter are somewhat technical but should present no difficulty for most readers.

Chapter 4 presents a basic descriptive national profile of the staff members of UB projects (directors, counselors, and instructors), including their background characteristics, education and training experiences, educational philosophies, and perceptions of the program and its students. This profile is developed from the questionnaire responses of staff members, but is augmented by impressions that were gained during site visits. Results are presented in nontechnical tabular form.

Chapter 5 contains a national description of the UB projects, including programmatic characteristics, advisory committees, costs, staffing patterns, and interactions between and among project staff, students, and community. The descriptive results presented in Chapter 5 are drawn primarily from questionnaire responses but are supplemented by reports from the project site visits. Most results are reported in a nontechnical tabular presentation.

Chapter 6 provides a different perspective of the national UB program, giving student perceptions of various aspects of the program. Student questionnaire responses provide the basis for this description, although impressions of the responses of students to interview questions during site visits are used to supplement the questionnaire data. The presentation of these results is nontechnical and tabular.

Chapter 7 reports the relationships between UB participation and student outcomes. The presentation in Chapter 7 is somewhat technical, but should present few difficulties to the majority of readers. The chapter includes discussions of baseline differences between UB and CS groups and an analysis of the impact of UB in terms of high school retention and entry into postsecondary education, as well as other measures of student outcome which are theoretically related to success in postsecondary education.

Chapter 8 contains an examination of the differential relative effectiveness of the UB projects sampled for this study. The chapter focuses on relationships between certain identifiable project characteristics (process differences) and student outcomes (output differences). The orientation of the chapter is that of generating hypotheses concerning which, if any, project characteristics are associated with successful projects (as measured by student outcomes). Chapter 8 is quite technical and employs advanced multivariate approaches to analysis.

Chapter 9 summarizes the major findings of the UB study and presents discussions of these findings and their implications for program policy.

The following appendices of supporting documents and technical information for Volume IV have been prepared and bound separately:

Appendix A, Data Collection and Processing Procedures.

Appendix B, Sampling Methodology and Sampling Error Computation.

Appendix C, Instrument Development.

Appendix D, Instruments and Important Letters.

Appendix E, Data Processing Procedures.

Appendix F, Weighting and Standardization.

Appendix G, Other Data Analysis Techniques.

Appendix H, List of Consultants and Advisory Council, Student Panel, and Analysis Committee Members.

Chapter 2

The Study Design, Methodology, and Procedures

I. INTRODUCTION

Much of the final study design was shaped by considerations outlined in the previous chapter. This chapter presents the final design and methodology, as well as the procedures followed in instrumentation, data collection and processing, and other preparation of data for analysis.

To obtain the data necessary to satisfy the study objectives and to obtain results that would contain little bias either for or against the program being evaluated, the study design involved the collection of data from many sources and from a broad spectrum of persons. Samples of UB project staff, UB students, and comparison students were all surveyed by written questionnaires. Data regarding students were also obtained from high school and project records, and, because questionnaire responses and data of record can sometimes provide a superficial or misleading picture, site visits were made by the RTI team members to personally observe project operations and interview project personnel.

The three basic groups providing data, the timing of data collection, and primary purposes of the data obtained are summarized below to provide an overview of the study design.

Students. In spring 1974, a sample of UB students and a sample of comparison students who had been enrolled in school at the beginning of the academic year (fall 1973) were administered questionnaires. One type of questionnaire was administered to students in the schools and projects; another was mailed to students who had dropped out of the schools or projects. The primary purposes of these questionnaires were to determine whether the students were still attending school and to obtain information about their background and other characteristics.

During the same period (spring 1974), course grades and other academic information (from the ninth grade to present grade level) were obtained for sample students. These data were obtained from school and project records. The purpose of these data was to determine whether course grades or curriculum changed after participation in UB.

In the fall of 1974, the same students were mailed short questionnaires to determine their school status and grade level. Brief telephone interviews were subsequently conducted to obtain similar information from a sample of those who had failed to return these fall questionnaires.

UB Project Staff. In spring 1974, questionnaires were mailed to a sample of the staff members of those projects from which the UB students had been selected. Specifically, questionnaires were directed to the project directors, counselors, and instructors of these projects, for the purpose of obtaining data about the characteristics of the staff members and of their projects.

Site Visits. In the spring and summer of 1974, 15 of the UB projects in the sample were visited (5 of the 15 were visited during both spring and summer, the remainder were visited only during the summer). The visits were made to obtain firsthand insight into the academic year and summer components of UB projects, as well as to validate some of the responses obtained in the returned UB staff questionnaires.

Data were also collected from high school staff personnel in an effort to explore the feasibility and value of a future study of the impact of UB on high schools that send students to UB. Because of low response rates to those questionnaires used in collecting data for such analyses and because of the poor quality of data that were collected, it was decided that results would not justify the expense of data processing and analysis. Therefore, the details of this small feasibility substudy are not presented in the body of this report. However, since the original design did call for the collection of these data, the details of instrumentation, sampling procedures, and data collection for the substudy have been included along with those of the principal study in Appendices A, B, and C; the instruments are not, however, included in Appendix D.

II. CONCEPTUAL FRAMEWORK

After the selection of the general approach, a process model was devised to guide the further development of the study design, and a synthetic cohort approach was adopted to help alleviate difficulties posed by the cross-sectional aspect of the design. These matters as well as the choice of the required comparison group are discussed in this section.

A. Comparison Process Model

A model depicting the specific details of the operation and effects of the UB program has been presented in Figure 1.1. The models to be described here represent more general models of processes. These models indicated the types of data that were to be collected, helped identify the sources from which the collection should be made, and thereby helped specify the study design and guide the analysis.

Any proposed examination of the UB program implies a study of a process. A simple model of the essential features of a process is depicted in Figure 2.1. To analyze the process, data relating to the several aspects of this model need to be obtained:

1) Operational characteristics (i.e., the structure and functioning of the process).
2) Characteristics of input (i.e., the nature of the raw material on which the process operates).
3) Characteristics of output (i.e., the nature of the designated product of the process).
4) Characteristics of resources required for operation (i.e., the nature of that which is required to start the process and keep it in operation).
5) Byproduct characteristics (i.e., the nature of any nondesignated results of process operation--over and above the designated output).
6) Relationships between various aspects of the system (i.e., any changes to characteristics of input as reflected in the characteristics of output; benefits of the process as reflected in desirable transformation of input into output and in desirable by-products; cost effectiveness, etc.).

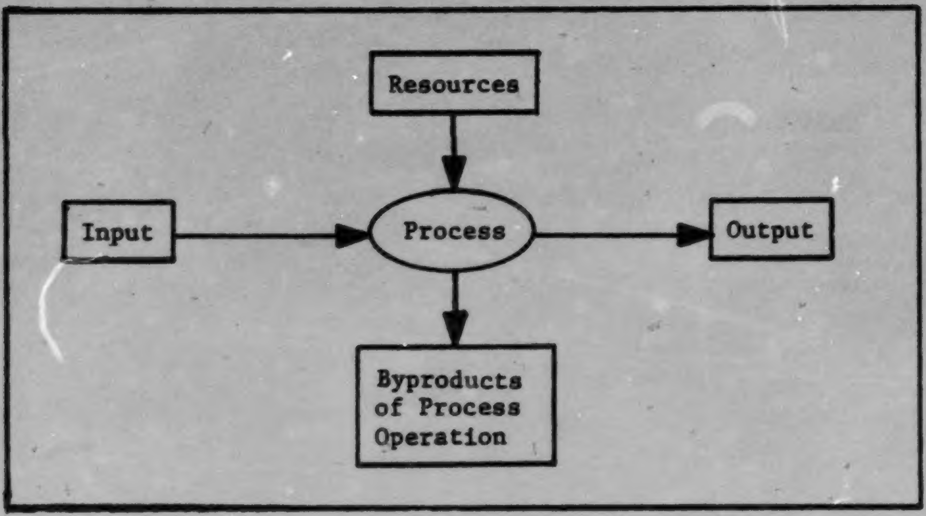


Figure 2.1. A Simple Process Model.

For many physical processes that take place over a short period of time, this type of examination is quite sufficient. For social processes (especially educational intervention processes such as UB), such examinations fall short in many respects, particularly in terms of definitively verifying the worth of the process. There are two major reasons for these shortcomings. First, these processes do not take place in a vacuum; rather, other processes operate on the input over the same period as the process under study. Second, the processes are not stationary over time; that is, the process itself is modified by external and internal forces. For these reasons, any desirable transformation of input into output or any desirable byproducts of a program such as UB could be attributable to other operating processes or to an interaction of the process under consideration with these external processes. As long as one is concerned only with descriptive characteristics of input, output, resources, byproducts, and operation at one point in time, the simple process model may be appropriate even for social processes. However, in examining relationships among the system elements, particularly in assessing worth or value of the process, or effects of process on input, the simple process model is typically insufficient.

To overcome these shortcomings in the evaluation of a process, the RTI research team adopted a process comparison model, which is depicted in Figure 2.2. Here one is concerned with a comparison of two (or more) processes operating within the same overall environment constituted by other ongoing processes.[1] These two processes function within the context of other ongoing processes (such as the high school educational system, community, and other social programs). Using such a process comparison model, a statement regarding the relative value of the two processes could be made in terms of the relative desirability of the two outputs (e.g., UB and non-UB school retention rates), relative cost effectiveness, relative desirability of byproducts, etc. Such statements, however, could be misleading if there were notable differences in input to the two processes due to some systematic selection mechanism. The validity of any statement regarding relative value based on differential output, byproducts, or resources required, therefore assumes that (1) input to the two processes under consideration is similar on relevant dimensions, and (2) all other relevant processes operate more or less equivalently on both sets of input. This is implicit in the depiction in Figure 2.2.

The first assumption concerning similar input requires that the comparison students be selected carefully, and that any systematic differences in the input characteristics between the UB group and the comparison student (CS) group be considered in analysis. The second assumption regarding the equivalence of other processes operating on both inputs (UB and non-UB students) requires that information about these other processes be collected for both groups and accounted for in the analysis.[2]

The models presented are very simple ones compared to the UB program as it actually exists. The UB program is, in reality, but one of several interrelated processes of educational intervention, each of which is a

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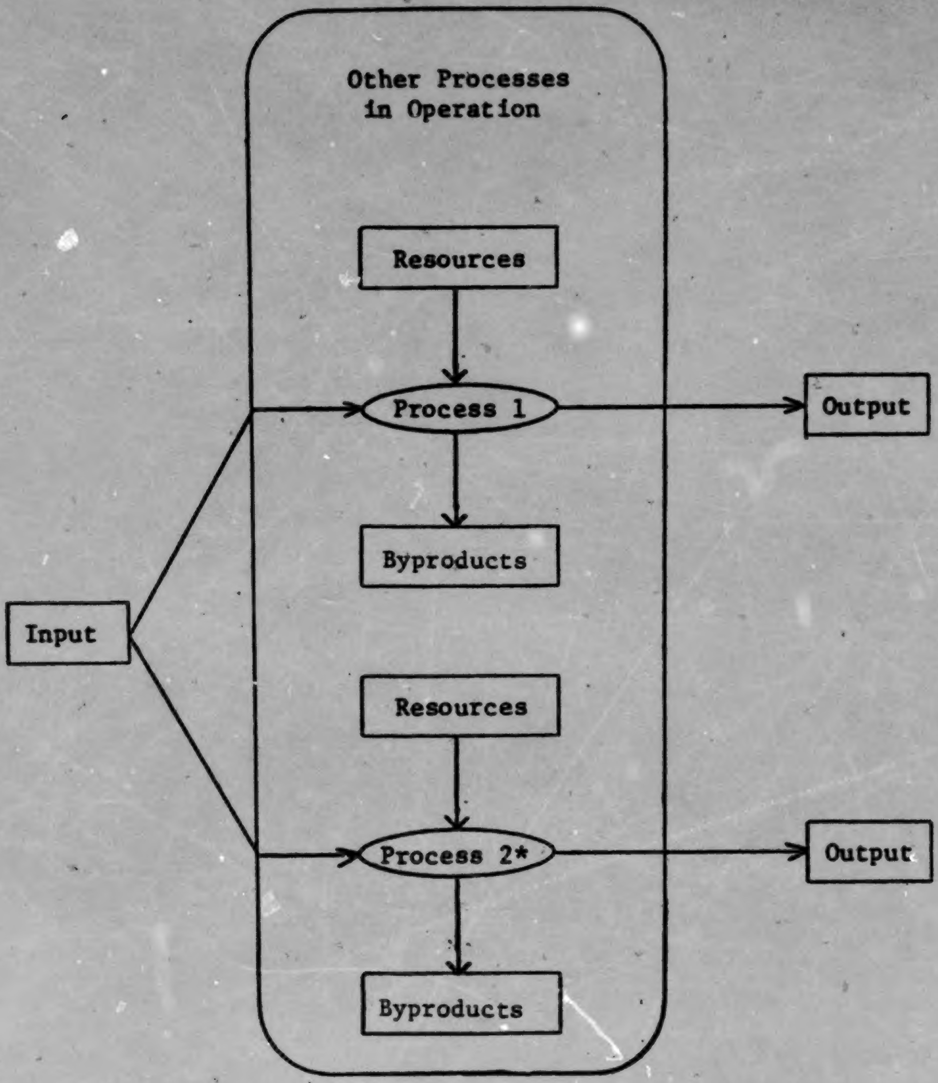
[1] One of the processes may arbitrarily be considered as an absence of the other process. Thus, UB could be considered as part of the processes, and the absence of UB (operating upon nonparticipating comparison students) as the other process.

[2] The choice of the appropriate CS group is discussed in subsection II.C and statistical adjustments for differences in Chapter 7 and Appendix F.


Other Processes in Operation
Resources
Process 1
Output
Byproducts
Input
Resources
Process 2*
Output
Byproducts

* Process 2 may be conceptualized as no more than an absence of Process 1.

Figure 2.2. A Simple Process Comparison Model.

subprocess of the larger network of educational and/or social development. Additionally, there are distinct, related subprocesses within the UB program and various feedback loops to adjust these subprocesses, as well as the main (UB) process, over time. The models are not, however, intended to depict precisely the intricate mechanisms of the UB program. Rather, the intent is to provide a conceptual framework for the study design and analysis. As such, the simple models are helpful in specifying the various classes of relevant variables to be measured and analyzed.

B. Synthetic Cohort Approach

UB, like most educational intervention programs, is a dynamic process which takes place over an extended period of time. The required data for analysis include baseline measures on input, measures of resources expended over time, measures of byproducts over time, measures of process structure and function over time, measures of the input at various stages of processing, and measures of final output in terms of stated purposes of the UB process. Similar data are, of course, required from a "comparison" group of non-UB participants to speak more definitively to the question of UB impact on the student. Such data may be collected either longitudinally or retrospectively.

The design used was basically cross-sectional; however, some retrospective and short-range longitudinal data were gathered. Three reasons led to this choice: (1) the pitfalls of obtaining retrospective data and the limitations on the types of such data which are retrievable, (2) the costs involved in the more desirable longitudinal approach, and (3) the more immediate concerns of government decisionmakers which precluded sole reliance on a longitudinal design (which would provide answers to crucial questions at a point too far removed into the future).

The cross-sectional approach poses a problem in that it examines a long-term process at a more or less frozen point in time. Various project participants at that point in time are not only from different age cohorts, but also at different stages of processing. The solution implemented for the current study is that of using a synthetic cohort, an approach that approximates total process action by examining the input and output at various stages of processing and putting together the various segments to present the total picture. An example of how this synthetic cohort approach can be used to avoid some of the problems encountered in a strictly cross-sectional approach is presented below.

Two of the major objectives of the UB program with respect to its target population are to increase high school (HS) retention rates and to increase postsecondary education (PSE) entry rates. Some past evaluations of the success of the program in attaining these objectives have examined whether UB participants in a specific senior class continue into postsecondary education at greater rates than do other poverty-level students in that same senior class. Such designs are weak because they do not control for the selectivity of the groups being compared. That is, they study comparison students who have "survived" on their own in a school system through which the UB participants have been specifically assisted (i.e., to become seniors). Thus, these comparison students are basically different from the UB group even if the two groups were equated on other relevant factors (e.g., socioeconomic status, ethnicity, high school type).

The synthetic cohort approach to the analysis of the UB process allows one to control to some extent for this selectivity or "survivor" effect, within the time constraints of the study period. Control is obtained by adopting a theoretical framework based on a transition of individuals through the various stages of the educational process. A simplified[3] depiction of this transition from tenth grade entry to completion of postsecondary study is given in Table 2.1. Such an approach is Markovian in character (with implication of postsecondary graduation or dropout as absorbing states). The various p_i values given in Table 2.1 represent conditional probabilities (relative frequencies) for transition to a subsequent stage, given attainment of a current stage.

The characterization of the p_i values as conditional probabilities allows the direct computation of the probability of the completion of the entire chain of steps. In a longitudinal study, such probability could be

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[3] The model presented is simplified in that it does not allow for atypical movement through the process (e.g., High School Equivalency programs, dropout and return, open door postsecondary institutions not requiring high school completion, etc.), but focuses on the typical progression.

Table 2.1

SIMPLIFIED TRANSITION MATRIX FOR PROGRESS THROUGH STAGES OF EDUCATION

	Educational Stage n + 1								
Educational Stage n	**10th Grade Completion**	**11th Grade Entry**	**11th Grade Completion**	**12th Grade Entry**	**12th Grade Completion**	**Postsecondary Entry**	**First Year Postsecondary Completion**	**Postsecondary Graduation**	**Dropout**
10th Grade Entry	p_1								$1-p_1$
10th Grade Completion		p_2							$1-p_2$
11th Grade Entry			p_3						$1-p_3$
11th Grade Completion				p_4					$1-p_4$
12th Grade Entry					p_5				$1-p_5$
12th Grade Completion						p_6			$1-p_6$
Postsecondary Entry[a]							p_7		$1-p_7$
First Year Postsecondary Completion[a]								p_8	$1-p_8$

[a] This transition probability could not be estimated within the current study design.

estimated directly from observing the students throughout the entire period. But in the case of a timebound study such as the present one, which is limited to an observation period of less than a year, such direct estimation is not possible. To the extent, however, that the individual p_i values can be estimated in a timebound study, the proportion of interest (proportion completing postsecondary education given tenth grade entry) could be estimated by the nature of the transition matrix. The probability of completion of postsecondary education given tenth grade entry is simply the product of p_1 through p_8. Different p_i values would, of course, have to be estimated from different student (grade level) cohorts, and assumptions must be made that the p_i values are relatively stable in time (and that the process is relatively stable) for the approach to be valid. That is, the assumption must be made that the transition probability (or dropout rate) for a given grade (e.g., eleventh grade) is the same over time. To the extent that such an assumption is basically true, the timebound study can answer critical questions regarding a process which takes place over a considerably longer time than the period available for observation.[4/] The transition matrix model can be applied to both UB participants and nonparticipants, and can be easily modified to take into account entry into the UB program at various points of educational attainment.

The survivor or selectivity effect can be examined within such a model. For example, a finding of no difference in the values of p_5 through p_8 between UB participants and nonparticipants would be considerably modified by a finding of considerably higher p_1 through p_4 values for UB participants. In other words, should the survivor effect be influencing any differential probabilities of twelfth grade completion or entry into and completion of postsecondary education, this influence can be taken into consideration by showing that survival rates for UB participants from tenth to twelfth grade are substantially greater than for comparison students. More succinctly, high school graduation and subsequent education are dependent on having obtained the twelfth grade level.

[4/] Although the transition matrix begins by assuming tenth grade entry, it is considered adequate for purposes of this study since almost all UB intervention comes at or after such a point in time.

In the present study, given populations of current UB participants and nonparticipants, and an available period for data collection of April through December 1974, computation of some of the p_i values required retrospective data while computation of others required data collected over a short longitudinal span. Specifically, estimates of p_1, p_3, and p_5 were obtained from studying three groups of UB participants and three groups of nonparticipants who entered the tenth, eleventh, and twelfth grades respectively at the beginning of the 1973-74 academic year, with notation in spring 1974 of those remaining in school. Since the year was nearly finished, if they were still in school, it could be assumed they were likely to complete the school year. Confirmation of completion was obtained in the next point in data collection (fall 1974, when the same students were again contacted to determine whether or not they had progressed into the next grade or into postsecondary education). These additional data were necessary for estimating p_2, p_4, and p_6. The values of p_7 and p_8 of Table 2.1 could not be estimated within the current study design. The specific cohorts from which each of the estimated values of p_i were to be obtained and the times of data collection are summarized in Table 2.2.

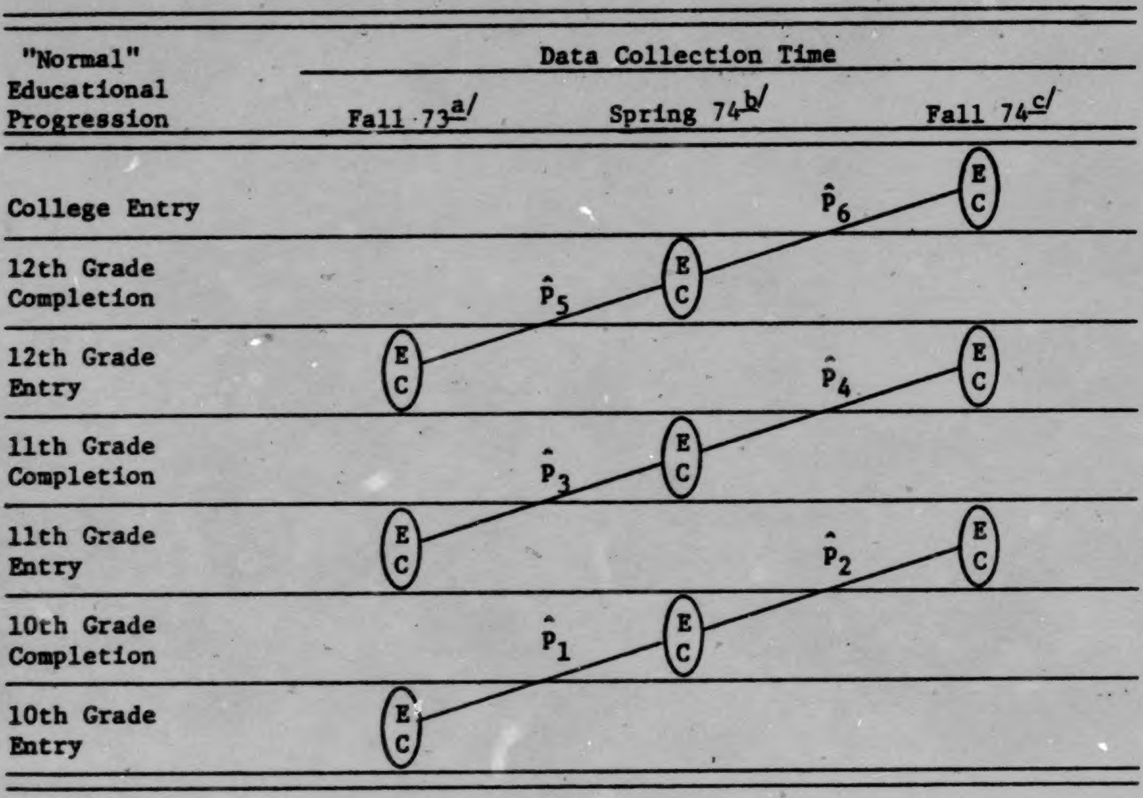
C. Comparison Students

The design of the study called for studying a CS group. Thus a comparison population was defined and sampled. In defining the comparison population, the goal was to identify a group as similar to the UB students as practicable, limiting differences to their nonparticipation in UB. For the approach adopted in the study, students in the same grades as the UB sample were selected. Because different schools influence the school continuation rate and other outcomes for their students, it was also considered desirable to define the comparison group as students attending the same schools as the UB sample. Finally, comparison students within each school were selected to be similar to UB students on the basis of low income and "academic risk" status (see below subsection IV.A for procedures followed in selecting the CS sample).

The choice of such a group presented two difficulties. First, to the extent that UB activity in a school has had a beneficial effect on students who have not directly participated in the UB program, the study results

Table 2.2

STUDENT COHORTS, POINTS OF DATA COLLECTION, AND ESTIMATES OF PROPORTIONS CONTINUING EDUCATION



"Normal" Educational Progression	Data Collection Time				
	Fall 73[a]		Spring 74[b]		Fall 74[c]
College Entry				$\hat{p}_6$	E C
12th Grade Completion		$\hat{p}_5$	E C		
12th Grade Entry	E C			$\hat{p}_4$	E C
11th Grade Completion		$\hat{p}_3$	E C		
11th Grade Entry	E C			$\hat{p}_2$	E C
10th Grade Completion		$\hat{p}_1$	E C		
10th Grade Entry	E C				

[a] Data obtained retrospectively (records show students to have been in school in fall 1973).

[b] First data collection period.

[c] Second data collection period (followup).

E = Upward Bound participants.

C = Nonparticipants.

would be biased toward underestimating beneficial effects of the UB program. Second, the comparison students from the same schools could represent students who theoretically could have participated in UB but for some reason did not choose to or were not selected by UB. In this basic manner, they would differ from the UB sample. The indirect or peer effects of UB on non-UB fellow students were considered to be relatively small because in general only a few students from any one school participate in UB and usually the participation effects no basic changes in the treatment of low-income students by the schools. The selection bias was not eliminated, but to some extent it was controlled by examining characteristics of selected UB and comparison students such as socioeconomic status, school grades and course of study prior to UB participation. By statistically adjusting for such differences, bias introduced by the selection problem is reduced.[5]

The two difficulties were judged as relatively minor, however, when compared to the problems presented by alternative definitions of the CS group. An alternative definition of the CS group that could take into account the peer effects would be students in the same grades as the UB sample but from schools not involved with UB. The problem presented by this definition is that such students are likely to have experienced very different school influences than the UB students. These school effects were considered to be of much greater magnitude than the peer and selection effects inherent in the other definition. The use of both comparison groups was considered desirable, but the expense of such an approach was prohibitive.

III. STUDY OBJECTIVES

The adopted process model specified the data to be collected for determining whether the UB program is increasing the rates of retention in high school and entry into postsecondary education (the two primary study objectives). In addition, the data specified by the process model were used to analyze other questions, which were of interest either because they would aid in the interpretation of the results of the two primary questions, or because they held programmatic interest to USOE, or both. These other questions, however, took a lower priority, secondary to the goal of providing accurate answers to the two primary questions. The various analysis questions can be organized into three general study objectives:

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[5] Although selection occurs and hence introduces possible bias, usually an UB project is able to accept into the program only a small fraction of all students who apply or stand to benefit, leaving a large pool of students who are similar to the UB participants.

a) To describe in detail the UB program as it exists at present (this includes a description of the characteristics of staff and students, their perceptions of the program, project operations and costs).

b) To investigate the effects of UB participation on students (this includes not only rates of high school retention and postsecondary entry, but changes in high school academic measures such as grade point average, preparation of courses that were "academic," etc.).

c) To compare the relative effectiveness of various types of UB projects in producing these effects (projects grouped by such variables as sponsorship, size, and primary project emphasis).

IV. SAMPLING PROCEDURES

The study design required that a variety of samples (e.g., of projects, schools, students, project staff) be taken. In all cases, probability sampling techniques were employed.[6/] This allows unbiased estimates to be made from the sample data, and estimates of sampling errors to be calculated.[7/]

[6/] In a probability sample, only some members from the entire study population are selected with a known probability of selection.

[7/] Because one is measuring only a sample of elements rather than all elements in a population, one can only estimate population values. If, for example, one wished to know the number of dropouts for the population of UB tenth graders, one could estimate this from sample data. When probability sampling is used, it is possible to compute estimates that are unbiased. The statistical meaning of the term "unbiased" is that the expected value of the estimate has the same value as the population value one is estimating. That is, the average value of the estimates for all possible samples would be equal to the population value. The actual value of the estimate would, of course, vary from sample to sample, and the standard deviation of the estimate is termed the sampling error (or standard error) of the estimate. The magnitude of the sampling error is related to two things over which the sampler can exert some control, namely, the size of the sample and the procedures used in selecting the sample.

Specific sampling procedures and considerations and the implications of these procedures for statistical examination are presented in Appendix B. Only a summary of the samples chosen are given in this subsection. Generally, in determining sample sizes, some estimates were made of the characteristics of the population, the size of the sampling errors that would be obtained from different size samples, and the cost of conducting various phases of the study.

A. Student Samples

To select the sample of UB students, a two-stage sample design was employed. In the first stage, a sample of UB projects was chosen. Weighing the required precision of the estimates to be made from the samples together with other operational considerations, it was decided to select 54 of the 333 UB projects into the sample. In the second stage, from each sample project, all UB students who were tenth, eleventh, or twelfth graders were selected, a total of 3,747 UB students.

To select the sample of comparison students, using the previously stated definition of the CS group, a multistage sample design was implemented. For each of the 54 UB projects selected into the sample, two "feeder" schools (those sending students to these projects) were selected.[8/] From each sample feeder school, a sample of six classrooms (typically two from each grade level 10, 11, 12) was selected. From the selected classrooms, a sample of students was then selected, averaging about 22 students per school, and yielding a total of 2,401 comparison students in the sample.

In order to select students who were likely to be similar to UB students from the sampled classrooms, information was obtained from classroom teachers regarding the grade level, ethnicity, low income status, and "academic risk" status of each student in the class. These variables were used to stratify the sample, and a higher proportion of students was selected from the group tentatively classified to be more like UB students (i.e., low-income and academic risk). This scheme allowed choosing more students

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[8/] In the final sample an average of two feeder schools per UB project was obtained but in several cases more or less than two feeder schools per project were used.

who were likely to be similar to UB in these important respects.[9/] The successive stages of selection of the UB and comparison students are summarized in Figure 2.3.

After the spring 1974 administration of questionnaires, the same students were asked to participate in a followup in fall 1974 (see Section VI.B.5). Some students failed to respond to the spring questionnaires, and some, to the fall questionnaires. After the fall followup questionnaires were returned, samples of nonrespondents to prior instruments were selected for telephone followup in late fall 1974. About one-half of all students who did not respond to the fall mailings but who had answered one of the spring questionnaires were chosen. All persons who failed to respond to both the fall and spring questionnaires were selected (excepting persons previously refusing to participate in the study or misclassified during the original sample selection).

B. Samples of UB Project Staff

For each of the 54 UB projects selected into the sample, several staff members were selected for the questionnaire survey. In each project, the Project Director, and a sample of counselors and instructors who worked full-time or part-time during the academic year or summer sessions, were selected from the staff. In general, six staff members per project with proportional representation of counselors and instructors were chosen. In this way, 54 project directors, 104 counselors, and 211 instructors were selected.

C. Site Visitation Samples

Of the 54 sample UB projects, 15 were subsampled for site visitation. Using stratified probability sampling procedures, the 15 projects were selected to include at least one project from each of the 10 USOE geographic

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[9/] The preliminary judgment by the teachers about the characteristics of the students were used only as an aid to sampling; the ultimate determination of whether the selected comparison students were similar was made during analysis on the basis of their own reports and school or project records. Differences between the UB and comparison students were statistically adjusted in analysis as explained in Chapter 7 and Appendix F.

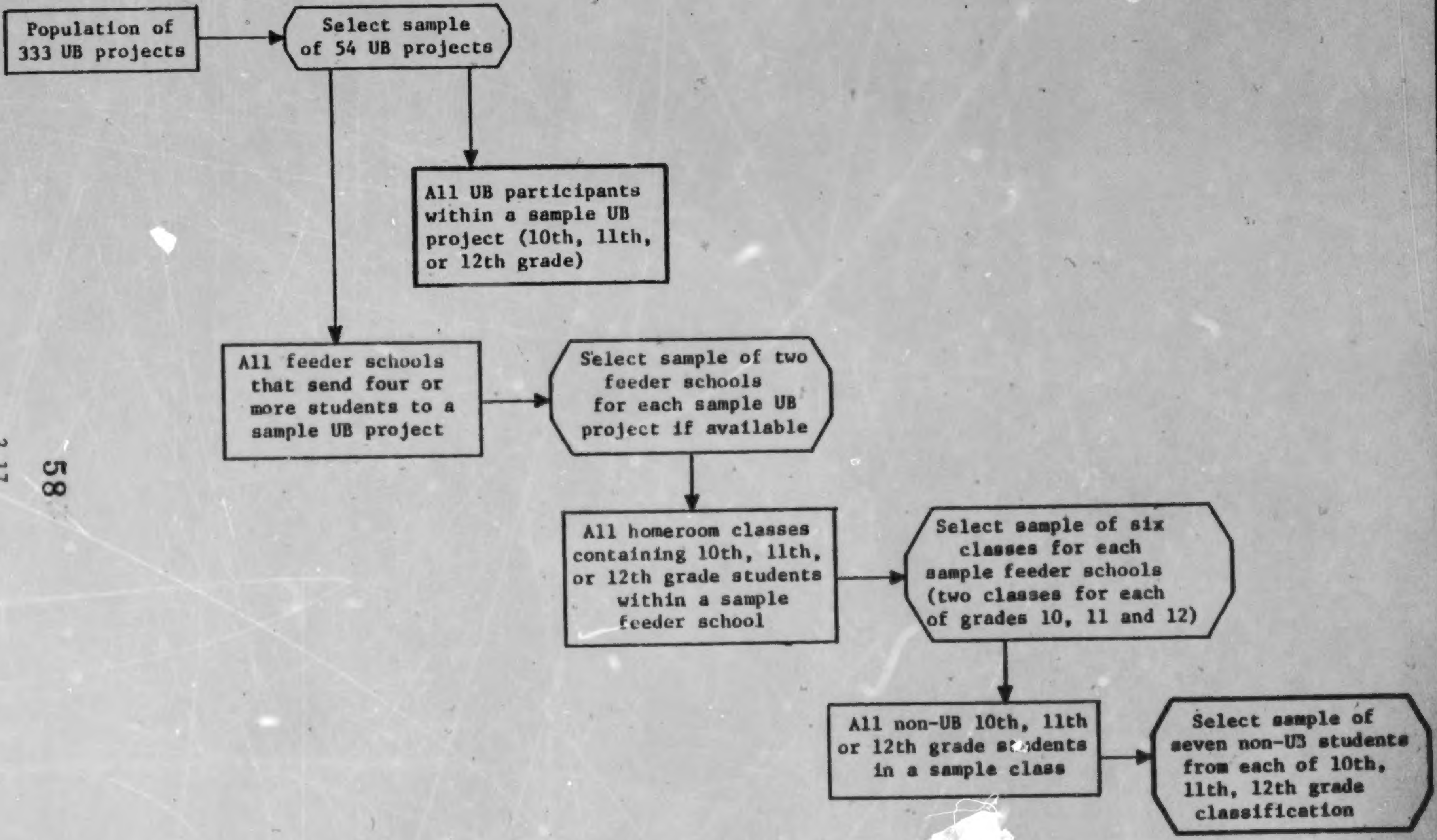
Population of 333 UB projects
Select sample of 54 UB projects
All UB participants within a sample UB project (10th, 11th, or 12th grade)
All feeder schools that send four or more students to a sample UB project
Select sample of two feeder schools for each sample UB project if available
All homeroom classes containing 10th, 11th, or 12th grade students within a sample feeder school
Select sample of six classes for each sample feeder schools (two classes for each of grades 10, 11 and 12)
All non-UB 10th, 11th or 12th grade students in a sample class
Select sample of seven non-UB students from each of 10th, 11th, 12th grade classification

Figure 2.3. The Structure of the UB Student and Control Student Samples.

regions, and to be representative of the population with respect to participant ethnic composition and location (i.e., whether they are from large city urban areas, other urban areas or rural areas). In addition, 3 of the 15 projects had strong academic programs which functioned during the school year as well as during the summer, and 2 had an associated Talent Search project.

After the subsample of 15 projects had been selected for site visitation, 5 of the 15 were designated to receive 2 site visits, one during the academic year and one during the summer. The remaining 10 projects received a single site visit during the summer. The three projects in the sample having strong academic year programs were designated with certainty to receive two site visits. Of the remaining 12 projects, 2 were randomly designated to receive two site visits, each of the 12 having been given the same chance of being designated.

V. INSTRUMENTATION

The study design called for the development of a large number of data collection instruments. This section provides a brief description of the instrumentation. A more detailed description of the development process and the instruments is given in Appendix C, while Appendix D contains copies of all the instruments.

A. Instrument Development

The study design required the development of a large number of instruments to collect data from many sources and from a wide range of persons. The process of instrument development began in early August 1973 and continued through January 1974. The stages of instrument development included: (1) specifying data elements required by the study objectives; (2) determining the types of individuals and other sources from which to gather the specified data; (3) drafting and revising the specifications for each instrument; (4) assembling instruments from related studies to serve as item pools; (5) drafting preliminary versions of each instrument; (6) presenting the instruments for review and revision by the Advisory Council and Student Panel; (7) performing limited pretests and subsequent revisions;

and (8) submitting the instruments to USOE and Office of Management and Budget (OMB) for approval (with two subsequent minor refinements).

A wide variety of groups and individuals provided valuable and critical input to the development of instruments at each of the above stages. The list of contributors includes the study Advisory Council, the Student Advisory Panel on Instrumentation, local project and high school staff members, and various consultants with expertise in related fields. Appendix H provides rosters of committee members.

When final specifications were available, a potential item pool was formed by assembling instruments used in other studies in related areas. This pool included instruments used by Hunt and Hardt[10/] in their evaluation of Upward Bound, instruments used by Educational Testing Service in the evaluation of the Special Services program,[11/] instruments which were being developed at RTI for the first followup of the National Longitudinal Study of the High School Class of 1972,[12/] and several instruments used by UB projects in self-evaluation (see Volume I of this report). Given the paucity of studies of this nature on Upward Bound, many of the major subject areas to be covered in the instruments were previously unexplored. In these areas, new items were written. The process of selecting items and drafting preliminary versions of each questionnaire continued through November and early December, 1973.

After formal reviews of the drafted instruments by the Student Advisory Panel on Instrumentation and by the Advisory Council, and after limited pretests and internal review by RTI personnel, the major instruments, along with a supporting statement, were first submitted for OE/OMB approval on 25 January 1974. After two sets of suggested revisions had been made, the

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[10/] David Hunt and Robert Hardt. Characterization of Upward Bound: 1967-1968. Syracuse, New York: Syracuse Youth Development Center, August 1968.

[11/] Junius A. Davis, G. J. Burkheimer, and Anne Borders-Patterson. The Impact of Special Services Programs in Higher Education for "Disadvantaged Students." ETS Project Report 75-14. Princeton, New Jersey: Educational Testing Services, 1975.

[12/] USOE Contract No. OEC-0-73-6666, Administered by the National Center for Education Statistics, Office of the Assistant Secretary for Education.

package was resubmitted on 18 March 1974. OMB approval of the major instruments was received on 3 April 1974.[13/]

B. The Instruments

Data were collected through questionnaire responses, interview responses, and student records. Most of the instruments used in this study were written questionniares. The Basic Student Questionnaire was administered by RTI study administrators to groups of respondents. For other instruments this was not feasible and questionnaires were mailed to respondents to be self-administered. Although the sometimes superficial nature of the questionnaire responses and objective data of record constitutes a drawback to this form of measurement, it was felt that the interviews and observations made during the 15 site visits would provide the necessary depth of understanding of the questionnaire data.

Since considerable reference will be made subsequently to the various questionnaires, acronyms will be used throughout the remainder of this volume. A single listing of the instruments and their acronyms is given in Table 2.3 for convenient reference by the reader. The specific instruments and designated respondents, are also outlined below.

1. High School Classroom Student Identification Roster (HSCR)

The HSCR was completed by selected classroom teachers as part of the plan for sampling comparison students in the sample of 108 feeder high schools. Data provided by the classroom teacher were: (a) a listing of all students in their classrooms in October 1973; and (b) for each student, his grade level, his ethnic classification, an indication of his academic risk status, and an indication of his low income status. This data source was available for all students in the comparison sample and was used to yield classifications of such students if the information was not provided by the students in one of the questionnaires. (No comparable data source was available for the UB students.)

[13/] Two simple instruments, the High School Classroom Identification Roster and the Project Roster Verification Form, were used to collect information for sampling in fall 1973 and were submitted for OE/OMB clearance in early fall 1973.

Table 2.3

BASIC INSTRUMENTS USED IN THE UPWARD BOUND EVALUATION AND THEIR ACRONYMS

Acronym	Instrument	Use of Instrument
BSQ	Basic Student Questionnaire	Collect information in spring 1974 from CS and UB students who were in HS.
D/TQ	Student Dropout/Transfer Questionnaire	Collect information from CS and UB students who had left HS or project by spring 1974.
FSQ	Fall Status Questionnaire	Collect information in fall 1974 from CS and UB students.
HSCR	High School Classroom Student Identification Roster	Collect information in fall 1973 on the CS group from HS classroom teachers.
PCQ	Upward Bound Project Counselor Questionnaire	Collect information in spring 1974 from UB counselors.
PDQ	Upward Bound Project Director Questionnaire	Collect information in spring 1974 from UB project directors.
PIQ	Upward Bound Project Instructor Questionnaire	Collect information in spring 1974 from UB instructors.
PRV	Project Roster Verification Form	Collect information in fall 1973 on UB participants from project staff.
SARF	Survey Administrator Roster Form	Collect information in spring 1974 about the CS and UB students by the RTI Survey Administrators during BSQ administration.
STF	High School Transcript Form	College HS transcript information in spring 1974; completed by RTI Survey Administrators.
SVR	Upward Bound Site Visit Reports	Collect information in spring and summer of 1974 on all aspects of project operation during site visits.

NOTE: The instruments are listed alphabetically by instrument.

2. Basic Student Questionnaire (BSQ, Forms A and B)

The BSQ was administered, in spring 1974, to students participating in UB and to a comparison group of nonparticipating high school students who were in the selected project feeder schools. Form A of this instrument, administered to the CS group, includes 51 items, and calls for over 200 possible responses. Form B, administered to UB participants, includes all the items in Form A plus a section specific to the UB program for a total of 67 items with over 320 possible responses. This questionnaire gathered information on preprocess measures (student background and previous experiences) and outcome measures (e.g., aspirations, educational plans and achievements, and self concept). It should be noted that these instruments were administered to only a subset of the entire student sample (specifically, those comparison students still in the same high school in spring 1974, and those UB participants still in the same project in spring 1974).

3. Student Dropout/Transfer Questionnaire (D/TQ, Forms A, B, and C)

The D/TQ was mailed to: (a) students in the CS group who dropped out, graduated, or transferred from the selected feeder schools between fall 1973 and spring 1974 (Form A); (b) UB participants who had left the UB program and/or high school during the same time period (Form B); and (c) UB students who were still in the program at time of BSQ administration but who were absent from the primary or makeup administrations (Form C).[14/] Forms B and C (for UB participants) differ from Form A (for the CS group) only in containing items which are specific to the UB program. Forms B and C differ in only one item. Form A includes 12 items with over 30 possible responses; Form B includes 19 items with 48 possible responses; and Form C includes 19 items with 49 possible responses. These instruments were designed to

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[14/] This use of the D/TQ was not anticipated during the design of the study, but due to low response rates from UB students (see Chapter 3) it was used as a convenient vehicle for obtaining some critical data from this group of students.

ascertain the dropout rate (as distinguished from transfer rate) during the school year for UB and comparison students; reasons for these dropouts; and, for UB students, reasons for leaving the program. The specific subgroups of students completing this questionnaire are obviously not "typical" of the UB or CS groups.

4. High School Transcript Form (STF, Forms A and B)

The STF was used by the study administrators in gathering information from high school transcripts of sample students. Information from this form relates to the student's academic record over time. Form A was used to obtain data for the CS group from school records. Form B was used to obtain similar data for UB students from UB project files. Only minor differences exist between the two forms.[15]

5. Fall Status Questionnaire (FSQ, Forms UBA, UBB, CSA, and CSB)

These instruments were used in two modes of data collection--as mail survey instruments and as telephone survey instruments. Initially, these questionnaires were mailed in fall 1974 to UB participants and comparison students selected for the study, to determine their educational status at that time.[16] At a later time, a telephone survey of a large proportion of FSQ nonrespondents was conducted, using questions from the mail version of the FSQ (altered only slightly to make them appropriate for telephone query). The "B" forms (CSB and UBB) of this instrument were addressed to previous non-respondents,[17] while the "A" forms (CSA and UBA) of the instrument were addressed to previous respondents. The "B" forms thus contain additional questions and represent a last attempt to obtain certain critical information from the student. Differences between UB forms and CS forms exist primarily in two questions relating to length of UB participation. Form UBA contains 9 items and calls for up to 19 responses; Form CSA consists of 7 items and calls for up to 17 responses; Form CSB consists of 13 items with 24 possible responses; and Form UBB contains 14 items with 26 possible responses.

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[15] The transcript information was theoretically available for all students in the sample, however, in the cases of dropouts or transfers, records had sometimes been forwarded or destroyed, and were therefore not available. Furthermore, the recordkeeping of UB projects was sometimes insufficient to provide the required information.

[16] Students who had previously refused to participate or for whom no tracing information had been previously obtained were not included in the mailing.

[17] Those who had not responded to any questionnaire during the spring 1974 administrations.

6. Survey Administrator Roster Form (SARF)

Another source of student data was the record kept by the study administrator during administrations of the BSQ (either at the project for the UB group or at feeder high schools for the CS group). Study administrators were directed to note the reasons why various students in the sample were unavailable for questionnaire administration or makeup sessions. The recorded information was obtained from high school personnel in the case of the CS group and from project personnel in the case of the UB group, and provides a supplemental classification of student's activity state in spring 1974 (i.e., school dropout, project dropout) for a substantial number of questionnaire nonrespondents.

7. Project Roster Verification (PRV)

A final source of UB student data is the PRV. The USOE mailed a listing of its most recent project roster to each project director of sampled projects for verification of project membership in fall 1973. Project directors specified the grade level of verified participants; thus these data were available for all UB students at projects from which the PRV was received.

8. Upward Bound Project Director Questionnaire (PDQ)

The PDQ was mailed in spring 1974 to the project directors of all 54 UB projects in the sample. The questionnaire was designed to gather descriptive information on the project director's background, experience, and attitudes and on the project's expenditures, staffing, goals, emphasis, content, and strategies. The questionnaire contains 42 items with over 550 possible responses.

9. Upward Bound Project Counselor Questionnaire (PCQ)

The PCQ was mailed in spring 1974 to selected counselors at each UB project in the sample. The questionnaire solicited information related to characteristics of the counseling staff and of the counseling function of the project. The questionnaire contains 35 items with over 200 possible responses.

10. Upward Bound Project Instructor Questionnaire (PIQ)

The PIQ was mailed to selected instructors at each UB project in the sample in spring 1974. The information gathered is similar to that described above for other UB staff questionnaires except that the emphasis is on instructor characteristics and the teaching function of the UB project. The questionnaire contains 40 items with over 290 possible responses.

11. Upward Bound Site Visit Report (SVR)

These reports, based upon site visits to a subsample of 15 UB projects, document and summarize the impressions which were gained through observation and unstructured interviews with UB students, project directors, project counselors and instructors, chairpersons of one or more of the UB Advisory Committees, and institutional representatives (officials responsible for the projects at the host institutions).

C. Classes of Variables

The kinds of data to be collected by the instruments described above were specified by the process comparison model (Figure 2.2). The classes of variables collected for study will be documented below in terms of this same model. There are many alternate methods of classifying variables, e.g., student variables, project variables, etc.—or criterion (dependent), predictor (independent), or adjustment (covariate, partialling, moderator) variables. It is felt, however, that the classification within the systems approach provides a more meaningful and integrated view of the data, consistent with the overall instrumentation and analysis plan.[18]

For the purposes of presenting the classes of variables, the process model is modified as shown in Figure 2.4. The model has been expanded to reflect the fact that there are various stages of input processing, each

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[18] Although the classes of variables developed are stated in terms of UB participants, it should be realized that in most cases analogous data were collected for comparison students who had not participated in UB.

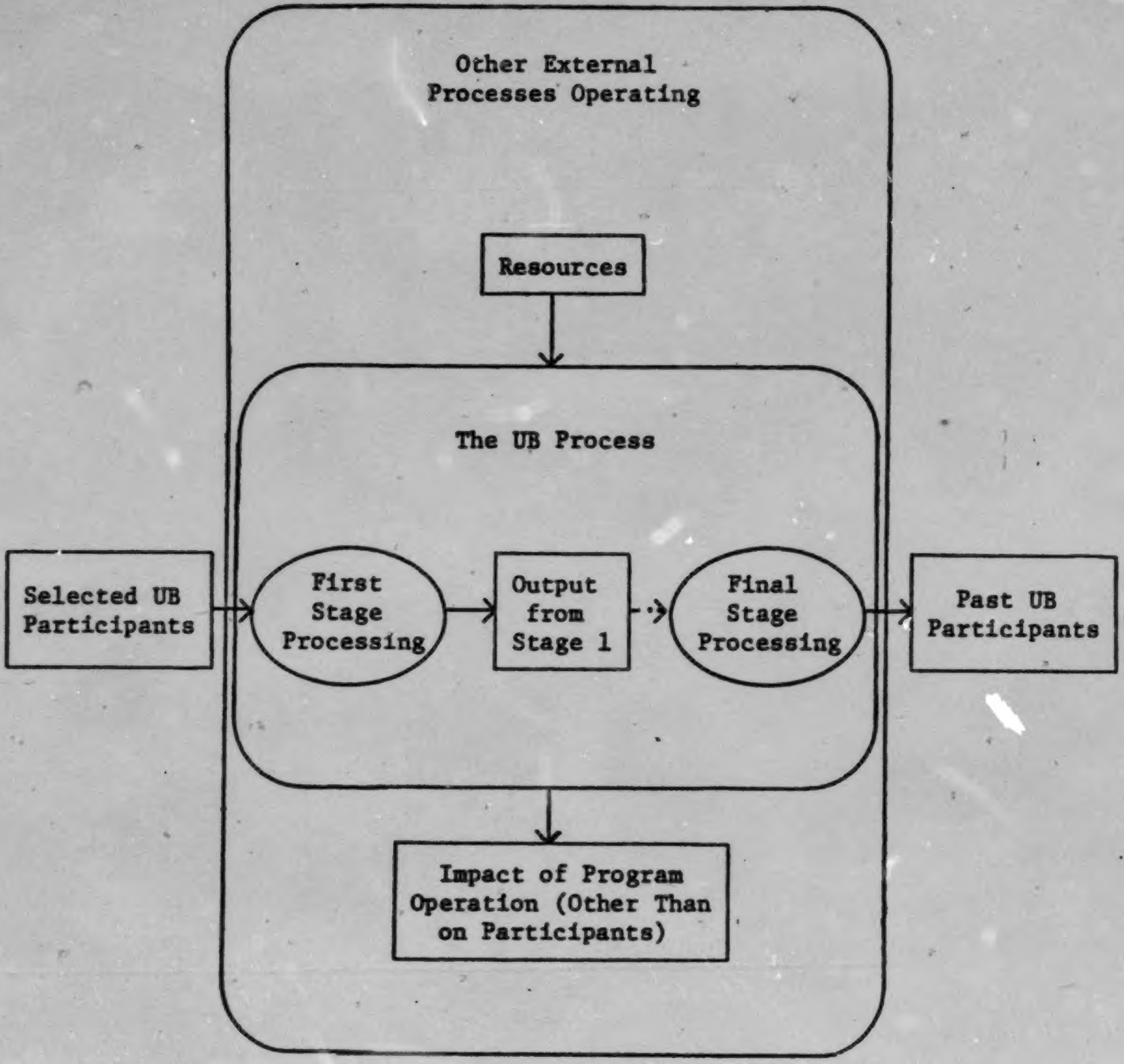
Other External
Processes Operating
Resources
The UB Process
Selected UB
Participants
First
Stage
Processing
Output
from
Stage 1
Final
Stage
Processing
Past UB
Participants
Impact of Program
Operation (Other Than
on Participants)

Figure 2.4. Simplified Process Model of Upward Bound.

with intermediate output (which, in turn, is the input to the next stage of processing). The analysis, using the synthetic cohort approach, makes use of this aspect of the model by examining participants at various stages of processing.[19] The model as presented in Figure 2.4 provides the conceptual framework which defines the essential classes of variables for analysis. These variable classes are described below and in greater detail in Appendix C.

Attempts were made to measure the specific variables listed, but for practical reasons (given in Appendix C) not all instruments could measure all variables; thus measures were not available for all students on all variables.

1. Pre-UB Process Data. Within this class of variables fall those attributes of UB participants (a) prior to their entry into the program (or at analogous points of educational development for CS students), or (b) which are relatively permanent and basically unaffected by the operation of the UB process.
2. External Process Data. This class of variables concerns other relevant processes besides UB which may be operating on the individual during the period of UB processing (or at analogous points of educational development for CS students). Of major interest here were (a) the existence and nature of such processes and (b) the extent of processing which the individual had experienced.[20]
3. Resource Data. This class of variables relates to resources used in project operation. Included are (a) all financial resources

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[19] The model may be easily expanded to a process comparison framework--either for purposes of comparing differential relationships by types of UB projects (processes differing in structure or function) or for purposes of comparing correlates of UB participation against nonparticipation.

[20] The major concern for the present set of data is the existence, nature, and extent of the operation of the external process as related to individuals. Attributes of relevant processes that may be operating on the structure and functioning of the UB programs were also considered in this study. But the concern in this latter case was not the individual student but rather the interaction of such processes with the UB process and the extent of this interaction. While such interaction data could be included here, they will be considered below under the class of data relating to program operation; i.e., such external processes in relation to the project will be considered as a part of the structure and function of the process.

(federal, private, institutional) of the project, (b) individual human resources (from the community, the host institution, etc.),[21] and (c) agency resources (host institution, feeder high schools, community) expended on behalf of the program. The major concern is again with the nature and extent of the various types of resources.

4. Byproduct Data. This class of variables relates to the possible effects of program operation on others besides UB participants, the broad spectrum of phenomena commonly labeled "program impact." Impact can be either positive or negative, but is typically considered as change which has been brought about (within external processes, as a result of program operation) in the attitudes toward, or functional treatment of, disadvantaged youth (e.g., families of participants, communities, host institutions, and high schools).[22]

5. UB Operational Data. This class of variables concerns the structure and function of the UB program. As mentioned previously, paid UB staff and the impacts of external processes on the program, per se, are subsumed under this class of variables. Also considered here is an evaluation of the structure and function of UB by project staff and student participants. Some of these data therefore reflect both objective and subjective information regarding program operational data.

6. Prior UB Processing Data. This class of data concerns the nature and extent of prior processing of the individual student participants in the UB program. Specifically the type and length of exposure of prior program participation as well as any historical

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[21] With respect to the second category of resources, regular project staff were not considered as resources, but rather as part of the structure of the process.

[22] Specific attributes related to these processes (as relevant to this data class) are the nature and extent of change experienced within such processes. It should be noted that there is a considerable interrelationship between this class of variables and categories (b) and (c) under Resource Data above (e.g., one valuable byproduct may be increased institutional resources offered to project).

pattern of interruption of program participation are considered, including the current project year.[23]

7. Intermediate Outcome Data. Here, intermediate objectives of the program, as measured by student outcomes, are considered. The outcomes may be instrumental to the achievement of major outcomes, or be of specific instrinsic value, or both. These outcome variables thus relate to possible program outcomes other than the three major objectives (e.g., measures such as grades, educational aspirations, etc.--where possible, stated relative to the preprocess measures of these variables).

8. Major Outcome Data. These data are concerned with the three major objectives of UB as previously defined (i.e., increasing secondary education completion rate of the target population, increasing enrollment rates in postsecondary institutions, and generating the skills and motivation necessary for success in postsecondary education).[24]

VI. DATA COLLECTION, RECEIPT CONTROL, AND MANUAL PROCESSING PROCEDURES

The introductory section to this chapter outlined the primary sources and schedule of data collection carried out in the study. The procedures followed in collecting the data are summarized below and are detailed in Appendix A.

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[23] It should be noted that for the CS group these data are inapplicable; thus these data were collected for UB participants only. Data relevant to subjective evaluation of these processes on the part of the student participant were also collected. There is an obvious overlap and relationship between this subjective data and that to be collected under UB operational data.

[24] The data which speak directly to the first two objectives are the estimates of transition probabilities outlined in subsection II.B above. Data relevant to the third objective were obtained primarily from the variables classified under Intermediate Outcomes above (e.g., specific skills and motivational increases which are commonly seen as related to postsecondary success, such as that derivable from high school course information).

A. Preliminary Activities

During the end of the planning phase of the study, mail and telephone contacts (and in some cases visits) were made with UB and high school personnel to inform them of the study, to obtain cooperation, to collect data required for sampling students and staff, and, in the case of schools, to establish liaison persons for future contacts. In the case of the UB projects, the persons contacted were the project directors; in the case of high schools, the principals were contacted, after the endorsement of officials at the state and district levels had been obtained. Subsequently, a liaison person at each feeder school was contacted to obtain information required for sampling comparison students and for arranging questionnaire administrations.

RTI survey staff visited study sites to plan the administration of the BSQ with the schools and projects, and to recruit, interview, and hire local study administrators. In 6 regional one-day training sessions held during April 1974, 64 study administrators were trained in the procedures required for administering the BSQ to students at the selected UB projects and schools and for collecting transcript information from project and school records.

B. Student Data

The steps involved in the complex flow of student data collection are summarized in Figures 2.5 and 2.6. Specific procedures are summarized below.

1. Administration of the BSQ

Administrations of the BSQ to groups of UB students were conducted during regularly scheduled meetings at the project sites. For projects that were not able to assemble sizeable proportions of their students on site, administrations were held for smaller groups at the high schools attended by the sample students. For projects in which less than 80 percent of the eligible students appeared at the originally scheduled administrations, one or more makeup sessions were conducted.[25] These procedures were implemented in April and May 1974. Because the response rate was lower than expected after these efforts, additional

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[25] For two projects with low response rates after the makeup sessions, BSQ questionnaires were mailed to the students.

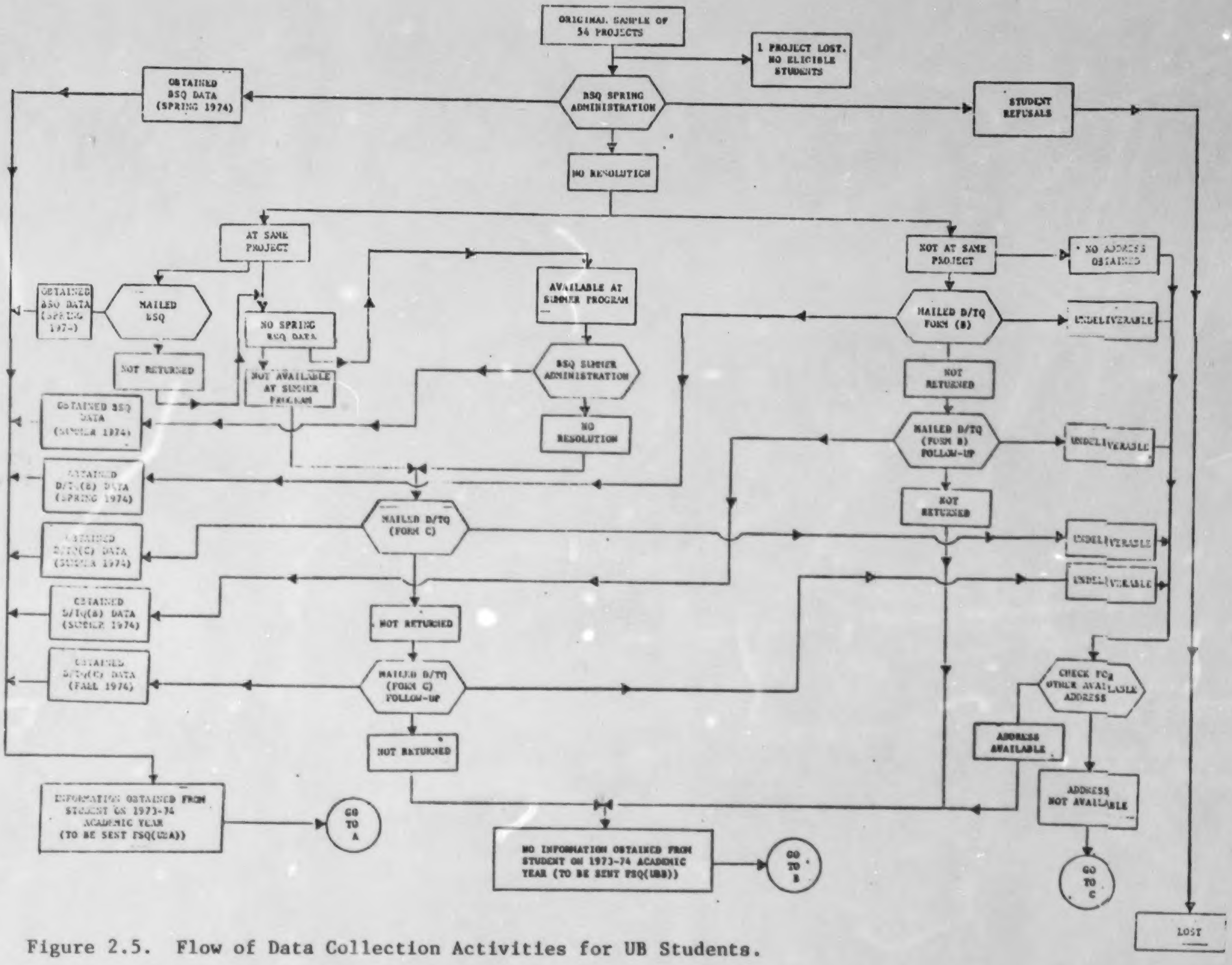
ORIGINAL SAMPLE OF 54 PROJECTS
1 PROJECT LOST. NO ELIGIBLE STUDENTS
BSQ SPRING ADMINISTRATION
OBTAINED BSQ DATA (SPRING 1974)
STUDENT REFUSALS
NO RESOLUTION
AT SAME PROJECT
NOT AT SAME PROJECT
NO ADDRESS OBTAINED
OBTAINED BSQ DATA (SPRING 1974)
MAILED BSQ
NOT RETURNED
NO SPRING BSQ DATA
NOT AVAILABLE AT SUMMER PROGRAM
AVAILABLE AT SUMMER PROGRAM
BSQ SUMMER ADMINISTRATION
NO RESOLUTION
OBTAINED BSQ DATA (SUMMER 1974)
OBTAINED D/TQ(B) DATA (SPRING 1974)
OBTAINED D/TQ(C) DATA (SUMMER 1974)
OBTAINED D/TQ(B) DATA (SUMMER 1974)
OBTAINED D/TQ(C) DATA (FALL 1974)
MAILED D/TQ FORM (B)
UNDELIVERABLE
NOT RETURNED
MAILED D/TQ (FORM B) FOLLOW-UP
UNDELIVERABLE
NOT RETURNED
MAILED D/TQ (FORM C)
UNDELIVERABLE
UNDELIVERABLE
NOT RETURNED
MAILED D/TQ (FORM C) FOLLOW-UP
NOT RETURNED
CHECK FOR OTHER AVAILABLE ADDRESS
ADDRESS AVAILABLE
ADDRESS NOT AVAILABLE
INFORMATION OBTAINED FROM STUDENT ON 1973-74 ACADEMIC YEAR (TO BE SENT FSQ(UBA))
GO TO A
NO INFORMATION OBTAINED FROM STUDENT ON 1973-74 ACADEMIC YEAR (TO BE SENT FSQ(UBB))
GO TO B
GO TO C
LOST

Figure 2.5. Flow of Data Collection Activities for UB Students.

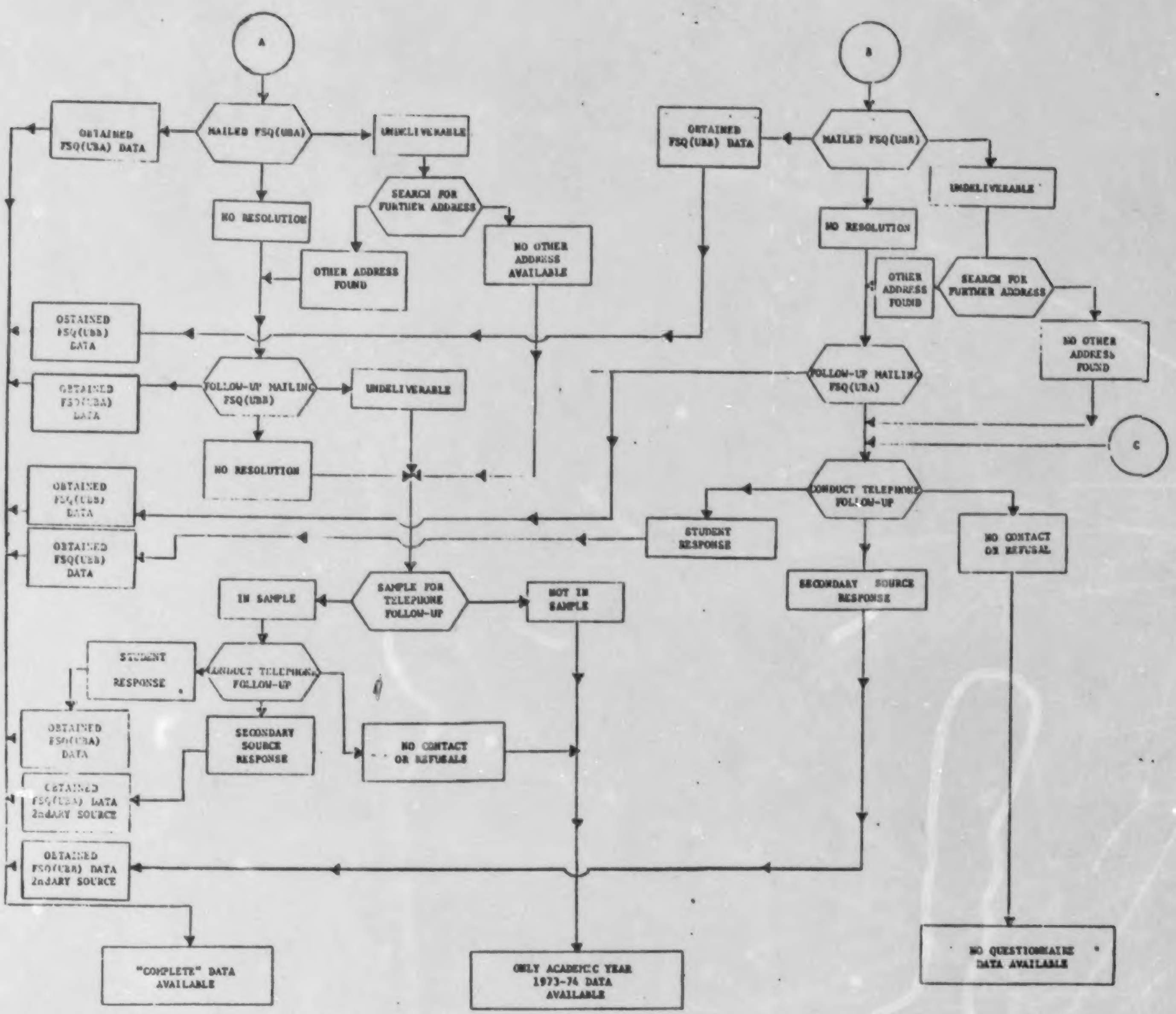
A
B
C
MAILED FSQ(UBA)
OBTAINED FSQ(UBA) DATA
UNDELIVERABLE
SEARCH FOR FURTHER ADDRESS
NO RESOLUTION
OTHER ADDRESS FOUND
NO OTHER ADDRESS AVAILABLE
OBTAINED FSQ(UBB) DATA
FOLLOW-UP MAILING FSQ(UBB)
OBTAINED FSQ(UBA) DATA
UNDELIVERABLE
NO RESOLUTION
OBTAINED FSQ(UBB) DATA
OBTAINED FSQ(UBB) DATA
SAMPLE FOR TELEPHONE FOLLOW-UP
IN SAMPLE
NOT IN SAMPLE
CONDUCT TELEPHONE FOLLOW-UP
STUDENT RESPONSE
OBTAINED FSQ(UBA) DATA
SECONDARY SOURCE RESPONSE
NO CONTACT OR REFUSALS
OBTAINED FSQ(UBA) DATA 2ndARY SOURCE
OBTAINED FSQ(UBB) DATA 2ndARY SOURCE
"COMPLETE" DATA AVAILABLE
ONLY ACADEMIC YEAR 1973-74 DATA AVAILABLE
MAILED FSQ(UBB)
OBTAINED FSQ(UBB) DATA
UNDELIVERABLE
NO RESOLUTION
OTHER ADDRESS FOUND
SEARCH FOR FURTHER ADDRESS
NO OTHER ADDRESS FOUND
FOLLOW-UP MAILING FSQ(UBA)
CONDUCT TELEPHONE FOLLOW-UP
STUDENT RESPONSE
SECONDARY SOURCE RESPONSE
NO CONTACT OR REFUSAL
NO QUESTIONNAIRE DATA AVAILABLE

Figure 2.5 (continued)

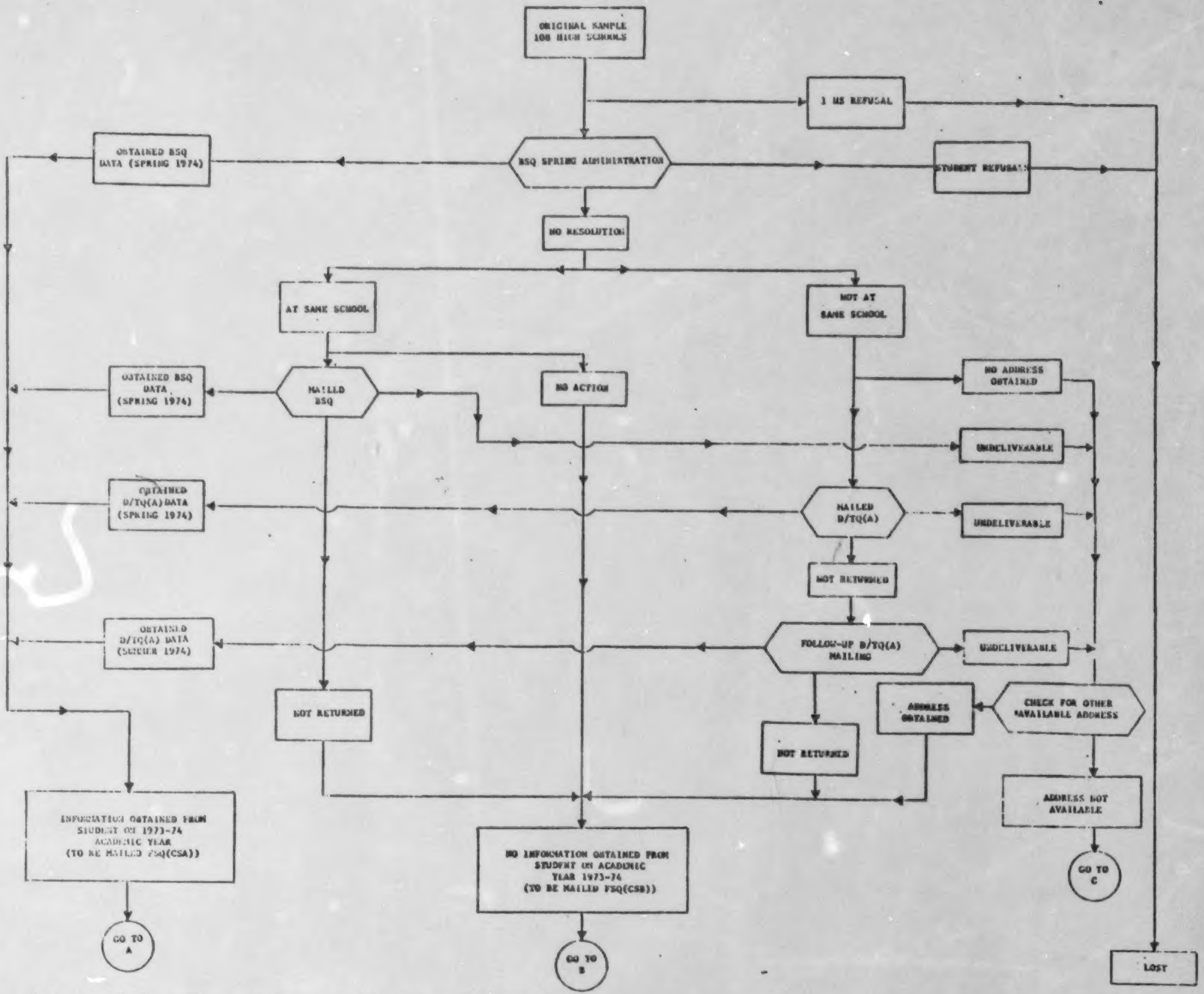
ORIGINAL SAMPLE 108 HIGH SCHOOLS
1 HS REFUSAL
BSQ SPRING ADMINISTRATION
STUDENT REFUSAL
OBTAINED BSQ DATA (SPRING 1974)
NO RESOLUTION
AT SAME SCHOOL
NOT AT SAME SCHOOL
MAILED BSQ
NO ACTION
NO ADDRESS OBTAINED
OBTAINED BSQ DATA (SPRING 1974)
UNDELIVERABLE
OBTAINED D/TQ(A) DATA (SPRING 1974)
MAILED D/TQ(A)
UNDELIVERABLE
NOT RETURNED
OBTAINED D/TQ(A) DATA (SUMMER 1974)
FOLLOW-UP D/TQ(A) MAILING
UNDELIVERABLE
NOT RETURNED
ADDRESS OBTAINED
CHECK FOR OTHER AVAILABLE ADDRESS
NOT RETURNED
ADDRESS NOT AVAILABLE
INFORMATION OBTAINED FROM STUDENT ON 1973-74 ACADEMIC YEAR (TO BE MAILED FSQ(CSA))
NO INFORMATION OBTAINED FROM STUDENT ON ACADEMIC YEAR 1973-74 (TO BE MAILED FSQ(CSB))
GO TO C
GO TO A
GO TO B
LOST

Figure 2.6. Flow of Data Collection for CS Student.

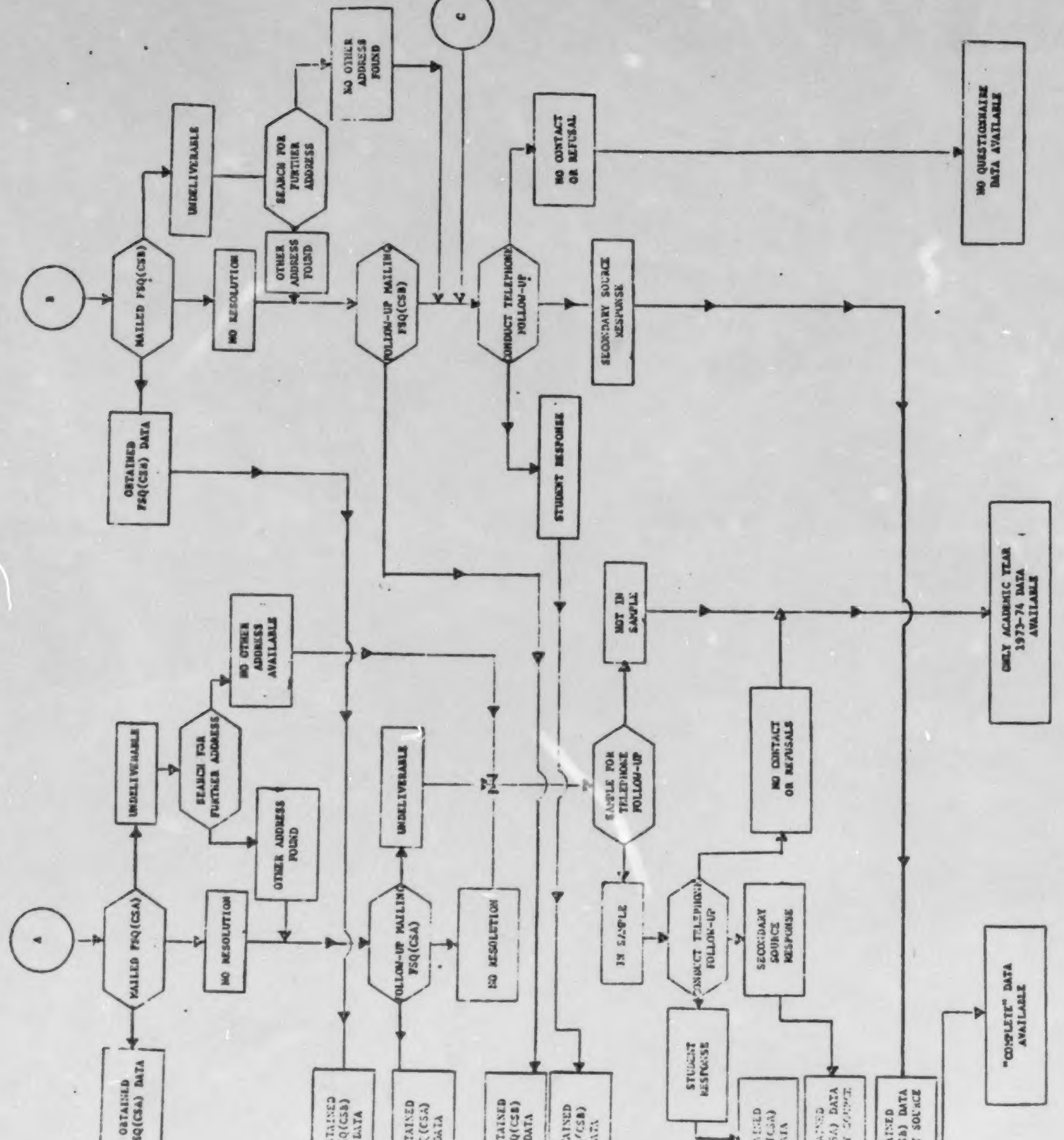
A
MAILED FSQ(CSA)
OBTAINED FSQ(CSA) DATA
NO RESOLUTION
UNDELIVERABLE
SEARCH FOR FURTHER ADDRESS
OTHER ADDRESS FOUND
NO OTHER ADDRESS AVAILABLE
FOLLOW-UP MAILING FSQ(CSA)
NO RESOLUTION
UNDELIVERABLE
OBTAINED FSQ(CSB) DATA
OBTAINED FSQ(CSA) DATA
OBTAINED FSQ(CSB) DATA
OBTAINED FSQ(CSB) DATA
SAMPLE FOR TELEPHONE FOLLOW-UP
IN SAMPLE
NOT IN SAMPLE
CONDUCT TELEPHONE FOLLOW-UP
SECONDARY SOURCE RESPONSE
NO CONTACT OR REFUSALS
STUDENT RESPONSE
OBTAINED FSQ(CSA) DATA
OBTAINED FSQ(CSA) DATA 2NDARY SOURCE
OBTAINED FSQ(CSB) DATA 2NDARY SOURCE
"COMPLETE" DATA AVAILABLE
ONLY ACADEMIC YEAR 1973-74 DATA AVAILABLE
B
MAILED FSQ(CSB)
OBTAINED FSQ(CSB) DATA
NO RESOLUTION
UNDELIVERABLE
SEARCH FOR FURTHER ADDRESS
OTHER ADDRESS FOUND
NO OTHER ADDRESS FOUND
C
FOLLOW-UP MAILING FSQ(CSB)
CONDUCT TELEPHONE FOLLOW-UP
SECONDARY SOURCE RESPONSE
NO CONTACT OR REFUSAL
STUDENT RESPONSE
NO QUESTIONNAIRE DATA AVAILABLE

Figure 2.6 (continued)

administrations of the BSQ to previously absent UB students were conducted during the summer UB program (in June and July 1974).

The BSQ was also administered to groups of comparison students at their schools during spring 1974. Makeup sessions were conducted where less than 85 percent of the potential respondents appeared for the original administration.

2. Collection of SARF Data

During the BSQ administrations at both the projects and schools, the study administrators obtained from project or school personnel the reasons for the absence of sample students and recorded these on the SARF. By this means, UB students who had left the selected projects, and comparison students who had dropped out or transferred from the selected schools, were identified. These students were thus identified to be the recipients of the mailed D/TQ (see subsection VI.B.4 below).

3. Collection of Transcript Information (STF)

During the weeks of BSQ administration, the study administrators gathered transcript data on all sample UB students from records kept in UB project files. These transcript data were recorded on the STF.[26/] Also recorded on this form was the current address of the student (if known) and two names and addresses of persons through whom the student could be reached. The transcript information for the sample CS group was obtained primarily from school files, and sometimes also from city and district school offices.

4. Mailing of the D/TQ

The entire package of BSQ, STF, and SARF were returned to RTI after completion of this data collection effort. The SARF identified the appropriate target students for the D/TQ, while the STF provided their addresses. As soon as these forms were received by RTI, the D/TQ was mailed to those identified to have left their project or school.

[26/] Because project files were not uniform in organization and amount of data recorded, the administrators expended considerable effort, with the aid of project personnel, in tracking down the desired information from schools and from a variety of project records. In addition, the study administrators required the aid of school and project officials in deciphering much of the transcript information.

For D/TQ's returned to RTI marked "undeliverable," a "second-best" address was obtained (if available) from the STF and was used for remailing the questionnaire. A followup D/TQ was mailed to nonrespondents a month after the original mailing.

Because the BSQ response rate among eligible UB students was lower than desired, even with the extra summer administrations, it was decided to mail a version of the D/TQ to the previous absentees. For each project, when it was decided that no summer makeup session was to be held or when summer makeups were incomplete, the remaining absentees were sent this version of the D/TQ. The first mailing occurred in July, with a follow-up mailing in August.

5. Mailing of the FSQ and Telephone Followup

In late September, 1974, the FSQ (Forms UBA, UBB, CSA, and CSB) was mailed to all CS and UB students for whom addresses were available. A month later, a follow-up FSQ was mailed to the nonrespondents. At each mailing, questionnaires returned as undeliverable were sent out again to a second-best address if possible.

After one mailed follow-up of the FSQ, the remaining efforts to contact nonrespondents were performed by telephone. The samples for the telephone survey included about 40 percent of all students who had not responded to the FSQ but who had previously responded to the BSQ or D/TQ, and all FSQ nonrespondents who had also not responded previously.

Experienced RTI telephone interviewers were trained to administer the FSQ via telephone. Interviewers made extensive efforts to use any available source (e.g. recorded addresses, projects, schools) to locate the student and to contact each potential source of information (e.g., respondent's parents, other relatives, friends, project or school personnel). If any potential source was contacted before the student was reached, that source was asked the questions on the FSQ. The information obtained on the same student (possibly from multiple sources) was recorded in each interview, along with the source. This method was employed to maximize the amount of information available on the subjects should the latter themselves not be reached. The telephone followup survey was conducted from the middle of November to the end of December 1974.

C. UB Staff Questionnaires

In April 1974, each sampled UB staff member was mailed the appropriate PDQ, PCQ, or PIQ. Several types of followup were employed. In mid-May 1974, project directors were requested by mail to urge the nonresponding staff members to return their questionnaires. In late August, staff questionnaires were again mailed to nonrespondents, and lists of these nonrespondents were sent to the regional Commissioners of Education and regional USOE officials asking their help. Finally, in October 1974, the project directors of nonresponding staff were telephoned to request their help in getting the questionnaires returned. In addition, other telephone contacts with the project directors or personal contacts during site visits were used to solicit the return of questionnaires.

In October it became apparent that certain financial questions in the PDQ had not been answered completely or uniformly. Therefore, each sample project director was requested by mail to send to RTI a copy of the 1973-74 program year final Grantee Financial Report (OE Form 1227). At the 15 site-visited projects, directors were asked to provide copies of their audit reports for the same year. In November 1974, USOE regional offices were requested by telephone to help obtain the OE Form 1227 and audit reports from projects which had not provided them at that time. These reports were used to help interpret and supplement PDQ responses to financial questions.

D. Site Visits

Two-day site visits were conducted at a total of 15 selected Upward Bound projects in the spring and summer of 1974. Findings and perceptions from these visits were expected to aid in the interpretation of the primary data gathered for the UB evaluation study. They would also serve as an additional source for program description data.

The overall purpose of these visits was to observe, discuss, and record the ongoing operations of Upward Bound in order to add a realistic prospective to the report of the evaluation study. Hard data were not gathered on program operations or other features of UB projects, since the essential effort was to "discover what was there" and considerable variability was anticipated. In this respect, it was not possible to approach each visit in the same way or to gather the same kinds of information, partly because circumstances varied and partly because of the subjective nature of site visits. As a result, the site visit data must be viewed as an impressionistic and sometimes inferential look at Upward Bound in action.

After selection of the sites to be visited, explanatory letters were mailed to project directors advising them of the upcoming visit and its purposes. Regional TRIO program officers were informed of those projects selected, and their assistance was solicited in emphasizing the importance of the visits in the UB evaluation study. Direct telephone contact was made with the project directors by RTI team leaders several weeks prior to the proposed visit, in order to clarify purposes, set up schedules for interviews, and discuss other related matters. In addition, preliminary information was obtained on the nature of the formal programs, numbers of personnel involved, and the feasibility of scheduling makeup sessions for administration of the student questionnaire.

Visits were conducted during the months of April and May 1974 for the academic year programs and during June and July 1974 for the summer programs. Selection of dates was typically made by project directors, in conjunction with schedules proposed by the RTI team leader. The attempt was made always to plan two visits in one trip in the interests of efficiency and economy. Site visits typically required two full days in the summer and one and a half days during the academic year. The team consisted of two persons in all cases except one, where three were involved.

E. Receipt Control

Separate procedures were followed for each instrument in keeping a current account of the status of the respondents. A log book was used to enter the completion status of the BSQ and STF for each sample UB and CS student, organized by project or by feeder school. For the D/TQ, a card file was maintained on all recipients of the D/TQ, and was used for recording and updating the completion status of each recipient. A master computer file was subsequently established to maintain for all sample students their addresses and completion status to all instruments. This computer file was used directly in maintaining the completion status to the FSQ. Finally, log books were used to record and update the completion status of the UB staff to their questionnaires, organized by type of questionnaire and by project.

F. Early Data Processing

Editing and coding manuals were prepared for all instruments except the site visit forms, SARF, and PRV.[27] A staff was trained to edit and code according to the procedures outlined in the manuals.

In the case of the BSQ, the open-ended questions were first manually edited and coded at RTI, and then the contents of the entire questionnaire were machine scored and entered onto magnetic tape by the Measurement Research Center, Iowa City. A computer tape for the UB and CS groups was created directly from edited hard copy. The D/TQ, STF, and UB staff questionnaires were all manually edited, coded, keypunched, and verified. FSQ responses were manually edited and coded[28] and directly entered onto magnetic tape, using direct data entry machines.

VII. DATA BASES AND COMMONALITIES

As seen in Sections V and VI of this chapter, the sources of data for this study were quite diverse. Different data elements were collected for each of several different groups by various modes of collection, at different time points, using different instruments. Further, some student instruments were designed to collect data exclusively from nonrespondents to other instruments, so that student questionnaire responses exist in disjoint data sets. The resulting large variety of respondents and instruments may present, on the surface, a somewhat amorphous set of partially related but seemingly disjoint data sets for each of several groups. In this section the disjoint groups will be defined, and the commonalities of these data sets and the common data elements making up logical data modules for analysis will be examined.

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[27] The SARF and PRV were used as data sources of final resort and thus were not all systematically coded. No site visit reports were coded due to their subjective nature.

[28] Hand coding was required on telephone survey responses because multiple questionnaires on the same subject could have been obtained from different sources. In the manual coding, for each question, only one answer (from one of the multiple sources) was selected for coding. The selection was guided by a priority system specified for each question; for each question, the system assigned the highest priorities to sources judged most likely to give valid answers, considering the nature of the question.

Table 2.4 defines the disjoint groups from which data were collected and specifies the mode of collection (by instrument) for each group. As can be seen from Table 2.4, the amount of data available for answering specific questions regarding the UB program is a function of the common data available, and not necessarily all the data collected. It should be noted, however, that the sources of data available for such groups are not the same and thus the information available is not the same. Analyses for the entire student group were thus limited to those variables which were common to all subgroups.[29/]

For current purposes, subgroups are defined by the particular instruments which group members completed. For some UB participants (or past participants) questionnaire information was collected prior to fall 1974. These previous respondents were asked to provide responses (by mail or telephone) only to the FSQ(UBA). Previous nonrespondents were asked to respond only to the FSQ(UBB), which solicited critical data not collected previously. Previous CS group respondents were asked to complete the FSQ(CSA), and previous nonrespondents were asked to complete the FSQ(CSB).

For analyses involving only UB staff, the data base problem was considerably reduced although not eliminated. For analyses involving a combination of staff questionnaire data with student data, the problems of diverse patterns of available student information were again encountered.

For purposes of addressing various questions to be answered by this study (see Chapter 3), analyses were directed toward a variety of different groups and subgroups of respondents. Given a particular analysis question, analyses were therefore restricted to data modules containing common data elements for the respondent group under consideration. The five major classes of data modules used in analyses were:

1) All-student data module.
2) Questionnaire-specific student data modules.

[29/] Note that UB participants and nonparticipants are further differentiated by virtue of having been mailed or administered alternate forms of a particular questionnaire, although there is high commonality among alternate forms.

Table 2.4

DESCRIPTION OF DATA SOURCE GROUPS AND DATA COLLECTED

Group	Data Sources Available
I. Students	
A. UB participants (as of fall 1973)	PRV, STF, and SARF
1. Still in project in spring 1974	
a. Refusals	No additional data
b. BSQ administration absentees	
i. Returned D/TQ and FSQ	D/TQ(C), FSQ(UBA)
ii. Returned D/TQ but not FSQ	D/TQ(C)
iii. Returned FSQ but not D/TQ	FSQ(UBB)
iv. Nonresponse to both instruments	No additional data
c. Participated in BSQ administration	
i. Returned FSQ	BSQ(B), FSQ(UBA)
ii. Nonresponse to FSQ	BSQ(B)
2. No longer in project in spring 1974	
a. Returned D/TQ and FSQ	D/TQ(B), FSQ(UBA)
b. Returned D/TQ but not FSQ	D/TQ(B)
c. Returned FSQ but not D/TQ	FSQ(UBB)
d. Nonresponse to both instruments	No data
B. CS students (in school, fall 1973)	HSCR, STF, and SARF
1. In same school in spring 1974	
a. Refusals	No additional data
b. BSQ administration absentees	
i. Returned FSQ	FSQ(CSB)
ii. Nonresponse to FSQ	No additional data
c. Participated in BSQ administration	
i. Returned FSQ	BSQ(A), FSQ(CSA)
ii. Nonresponse to FSQ	BSQ(A)
2. Not at same school in spring 1974	
a. Returned D/TQ and FSQ	D/TQ(A), FSQ(CSA)
b. Returned D/TQ but not FSQ	D/TQ(A)
c. Returned FSQ but not D/TQ	FSQ(CSB)
d. Nonresponse to both instruments	No additional data
II. UB Staff (with project during or prior to fall 1973)	
A. Project Directors	
1. Responded	PDQ
2. Nonresponse	No data
B. Counselors	
1. Responded	PCQ
2. Nonresponse	No data
C. Instructors	
1. Responded	PIQ
2. Nonresponse	No data

3) Group-specific student data modules.
4) Project data module.
5) Questionnaire-specific project staff data modules.

A. All Student Data Module

In addressing questions regarding the entire sample of students, or in generalizing to the populations from which they were drawn, one is restricted to this data module. The elements of this module are: (1) common elements of the BSQ, the FSQ, and the D/TQ; and (2) other common elements of instruments such as STF, SARF, HSCR, and PRV.

There are relatively few common elements across the BSQ, D/TQ, and FSQ because the latter two questionnaires were deliberately shortened. It was considered necessary to minimize the length of these two mailed questionnaires in order to increase the likelihood that the respondents would complete and return them. Further, in the case of the D/TQ, it was felt that the respondents, being school or project dropouts, were least likely to be interested in completing questionnaires.

The data for this module are, therefore, quite restricted. A major implication of this restriction is that these are the data from which estimates of academic-year continuation rate were obtained. Any "corrections" (to adjust for initial differences between the participant and comparison groups) to the continuance proportions were necessarily limited to the variables of this data module.

Table 2.5 indicates commonalities among the various student questionnaires (and thus common questionnaire data elements for the all student data module). It should be noted that there is a very small number of common variables. The student questionnaire data commonalities, as shown in Table 2.5 are: (1) age, (2) sex, (3) a very rough poverty level index (determined from number of persons supported and reported family income), (4) race, (5) grade level in fall 1973, (6) activity state (in or out of school, job, postsecondary enrollment, high school equivalency enrollment) in spring 1974,[30/] (7) reported high school GPA for 1972-73 school year, (8) date of first participation in UB (applies only to UB students), (9)

[30/] See Appendix E for complete definitions and determination of activity states.

Table 2.5

COMMONALITY OF STUDENT QUESTIONNAIRE DATA

BSQ(UB) Item No.	BSQ(UB) Item No.	D/TQ(UB) Item No.	D/TQ(CS) Item No.	D/TQ(C) Item No.	CS FSQ(A) Item No.	UB FSQ(A) Item No.	CS FSQ(B) Item No.	UB FSQ(B) Item No.
1	1	1[a]	1[a]	1[a]			1[a]	1[a]
2	2	2	2	2			2[a]	2[a]
3	3							
4	4							
5	5	5a	5a	5a			13a	14a
6	6	3[a]	3[a]	3[a]			11[a]	11[a]
7	7							
8	8							
⋮	⋮							
14	14							
15	15	5b	5b	5b			13b	14b
16	16							
17	17							
18	18							
19a	19a	9a	9a	9a		1[b]		3a[b]
19b	19b	9b	9b	9b			3[a]	3b[a]
20	20							
21	21							
22	22							
23	23							
24	24[a]							
25	25							
26	26							
27	27	4[c]	4[c]	4[c]			12[c]	13[c]
28	28							
⋮	⋮							
50	50							
51								
52								
53						8[a]		10[a]
54								
55		14[c]		14[c]				
⋮								
67	51	15	12	15				
		6	6	6			3[a]	3b[a]
		7	7	7				
		8	8	8				
		10	10	10	1	2	4	4
		11	11	11				
		12		12[a]		9[b]		11[b]
		13		13				
					2	3	5	5
					3	4	6	6
					4	5	7	7
					5	6	8	8
					6	7	9	9
					7		10	

[a] Question in slightly different form..

[b] Question in considerably different form but same basic information.

[c] Grossly different form but same type of information.

highest grade completed, (10) date of last participation in UB (applies only to UB students), (11) activity state in fall 1974, and (12) change of UB participation status. For this common data base to be available for a student, "complete" data on the student, was required (either 1) completion of appropriate items on the BSQ or D/TQ, or 2) Completion of appropriate items on the FSQ(B)). Additionally, other student-related data were available (to various degrees) which allowed classification of some students at one or more points in time and which were used as supplementary sources for one or more incomplete data items. These data were available from HSCR (CS only), PRV (UB only), SARF, and STF. Moreover, the STF provided a fairly rich data base regarding high school academic information.

B. Questionnaire Specific Student Data Modules

Some of the analysis questions posed can only be answered by use of data available from a particular questionnaire (e.g., questions relating to students' educational aspirations are only available from BSQ respondents; and questions relating to reasons for dropping out of school are only available from D/TQ respondents). Due to different forms of these questionnaires, any question relating to the entire group of questionnaire specific respondents is limited to the common data items on alternate forms of the questionnaires (see Table 2.5).

C. Group Specific Student Data Modules

Some student analysis questions relate to specific student groups defined by a reported or observed classification during the course of the study (e.g., high school graduates reporting postsecondary educational continuance; students eligible for BSQ administration who did not respond to the BSQ but who responded to one or more other questionnaires). Questions relating to these specific groups are restricted to data modules defined by the common data items available for the specified group.

D. Project Data Module

This data module provides a source of data for addressing questions related to the population of UB projects. As specified in Section IV of this chapter, the project was the first stage of sampling for all subsequent samples described earlier. Thus the common data elements for projects included all data from project staff as well as the student data modules for UB participants and the CS group, specific to that project. Typically, only a limited subset of the data was used in any particular description or comparison of projects. When addressing questions at the project level regarding student characteristics, aggregated student data within project was considered (see Chapter 8 and Appendix F). Most questions related to this module concerned data provided in response to the UB staff questionnaires. At the level of project centered questions, questionnaire data from counselors or instructors was aggregated within staff position.

Additional data commonalities exist among the UB project staff questionnaires. These data were used for descriptive purposes (e.g., describing staff members) as well as for project-related analyses. Data commonalities among the project staff instruments played a different role than student data commonalities. Similar questionnaire items relating to perceptions of projects by different staff members provided a natural vehicle for examination of divergence of perception and opinion within a project and for obtaining an aggregate index of project operation. The commonalities among these sets of instruments are given in Table 2.6.

E. Questionnaire Specific Project Staff Data Modules

These data modules are completely defined by the PDQ, PIQ, and PCQ, respectively. These modules were used in addressing questions related to national estimates of characteristics of UB staff members within a particular staff role.

VIII. OVERVIEW OF DATA PROCESSING

Prior to any considerations of analysis of student or project data, it is important to consider certain data management and manipulation procedures which have implications for analysis. A major matter of concern relates to the techniques by which the large array of data, described in the previous section, were distilled and sifted to produce meaningful indices for use in analysis.

Table 2.6

COMMONALITIES FOR PROJECT STAFF QUESTIONNAIRES

Project Director Questionnaire	Project Counselor Questionnaire	Project Instructor Questionnaire
1		
2a[a/]	1	1
2b[a/]	2[a/]	2[a/]
3[a/]	3[a/]	3[a/]
4[a/]	4a[a/]	4[a/]
5[a/]	5[a/]	5[a/]
6[a/]	6[a/]	6[a/]
7[a/]	7[a/]	7[a/]
8[a/]	8[a/]	8[a/]
9[a/]	9[a/]	9[a/]
10[a/]	10[a/]	10[a/]
11a[a/]	11a[a/]	11[a/]
11b[a/]	11[b/]	
12		
13		
14		
15a[a/]		18[a/][d/]
15b-f		
16[b/]	19[b/]	24[b/]
17[b/]	20[b/]	25[b/]
18[c/][e/]	23[c/]	26[c/]
19		
20		
21[c/][h/]	22[c/]	23[c/]
22		
23[b/]	30[b/]	29[b/]
24		
25		
26		
27		
28[b/]	32[b/]	38[b/]
29		
30[b/]		
31		
32		
33		
34[b/][d/]	34[b/]	35[b/][g/]
35[b/]	35[b/]	36[b/]
36		
⋮		
42		
	4b[c/]	4b[c/]
	12	
	13	
	14[c/][h/]	13[c/]
	15[c/]	14[c/]
	16[c/]	15[c/]
	17[c/]	16[c/]
	18[c/][h/]	17[c/]
	21[c/]	22[c/]
	24	
	25	
	26	
	27	
	28[b/]	40[b/]
	29	
	31[c/]	37[c/]
	33[c/]	39[c/]
		12
		19
		20
		27
		28
		30
		31
		32
		33
		34

[a/] Same personal information but for different persons.

[b/] Information about project or education intervention philosophy from different points of view.

[c/] Project related activities or experiences of different staff members.

[d/] Scale inversion.

[e/] Very small commonality, question is marginally similar for PD.

[f/] Scale inversion Part a--Part b is somewhat different for PD.

[g/] One category omitted for PI.

[h/] Scale differences.

There were several factors in the design of the study that created the need for considerable processing of the data prior to analysis. The use of different instruments raises the question of inconsistencies and imputations within and among instruments and that of a least common data base (see previous section) in analyses relating to all students or all projects. The matter of differing sources of information (particularly in the case of the telephone followup--see above subsection VI.B.5 and Appendix A) raises the question of differential validity of data sources. The different time periods involved for student data create an additional consideration of inconsistency of data and logical imputation between time periods.

The two major areas relating to data manipulation are: (1) general computer checks, edits, and imputations, and (2) development of analysis files. These areas are addressed briefly below and are covered in greater detail in Appendix E.

A. General Computer Check, Edit and Imputation Procedures

The specific details of editing UB data files were somewhat different from instrument to instrument, due primarily to: (1) different response patterns (particularly skip patterns, inconsistency check patterns, and imputable items), and (2) differential preparation of raw data files (i.e., machine scored or keypunched). There were, however, general principals of computer checking and editing. The general form of editing for the files was: (1) initial check to ascertain that data were in order (sorting of records, and subrecords in the case of card format; and deletion or resolution of "noise" records, bad ID codes, and duplicate records), (2) supplemental data coding, (3) out of range checks and conversion of all "errors" to a standard error code system, (4) routing item checks and appropriate coding of inconsistencies, (5) inconsistency checks, and (6) final editing step (including complete check of file and any logical or stochastic imputations). An overview of important characteristics of the editing steps is presented below.

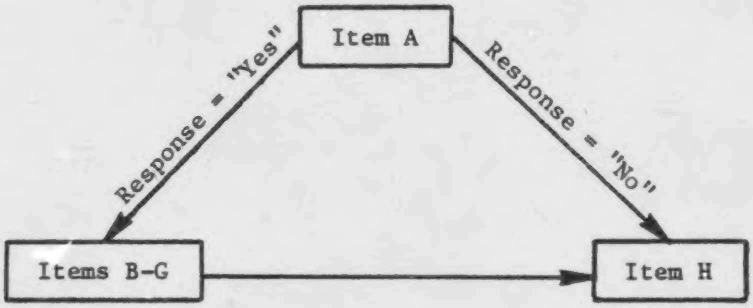
1. General Supplemental Codes and Error Codes

This step involved creating a supplemental coding system which (a) allowed a supplemental code identifying inconsistent items within a record, and (b) allowed a supplemental code to identify data which had been imputed. The supplemental code allowed such data to be selectively screened for analysis (see Appendix E for specific details of the system).

In addition to the supplemental codes, codes were developed and used to denote certain types of responses that normally are not usable in analysis. Specific codes were developed to identify nonresponse, legitimate nonresponse, multiple response, nonresponse inconsistent with routing items, out of range response, "don't know" response, refusal, item not administered (used for merged files containing different forms of the same instrument), and unavailable response (indicating questionnaire nonresponse). These coding procedures are detailed in Appendix E.

2. Routing Item Checks

There are a variety of routing items in the various UB instruments. The simplest type is a skip pattern and is illustrated by the following diagram in which the answer to A routes the respondent to either answer B through G or to skip B through G and proceed to item H.



In general, editing procedures produced a supplemental data code or error code when a routing question or data inside a skip pattern were answered inconsistently with respect to other data in the skip pattern. For more complex routing items, i.e., double branching or nested patterns, analogous techniques and codes were used.

3. Inconsistency Checks

A series of inconsistency checks was performed for each instrument. The specific checks performed varied from instrument to instrument. Data items found to be inconsistent on any check were assigned a specific supplemental data code.

4. Imputations

There are two different types of imputations. Different supplemental code values were assigned to imputed data on the basis of the type of imputation performed. The first type of imputation is that of logical implication from existing data. For example, a student may have indicated that he was in high school at a given point in time, but neglected to give his grade. If, at the same point in time, that student indicated that the highest grade he had *completed* was the tenth grade, one could deduce that his grade level at that time point was the eleventh grade.

A second type of imputation performed is a stochastic inference from existing data elements. As an example, a student may have indicated that he was in high school in grade n during the spring of one academic year and also in high school the following fall without indicating grade level for the fall. For $n < 12$, it is highly probable that the individual is in grade $n + 1$ in the fall (for $n = 12$ the *logical* imputation is *still in grade 12* in the fall). This will not necessarily hold for every case (since the student may have failed to advance); however, in the large majority of cases, such an imputation would be correct.

B. Analysis File Construction

The analyses performed for this study may be categorized into four major groupings: (1) student oriented analyses, (2) project staff analyses, (3) project specific analyses, and (4) project by student analyses. The scope of these analyses is documented in Chapter 3 and will not be considered here; rather, this section will examine some manipulations of data necessary for conducting such analyses. These procedures are more fully documented in Appendix E.

In Section VII, the reader was introduced to the disjoint data sets collected from students, staff, and other sources. For most of the analyses, the original questionnaire data sets as separate entities were insufficient for analysis, even when augmented by sampling weights. For example, examination of responses to the BSQ (an analysis specific to one set of respondents and one data set) was undertaken only after data external to the BSQ file were examined and appropriately merged with the BSQ data (i.e., high school grades from the STF file, external validation of student status). The rather lengthy and complex set of merging operations prior to actual analysis is discussed in Appendix E. Various procedures for validating and determining activity states are treated briefly below.

1. Determining Student Activity States

Any analysis of the student data within the general model proposed (subsection II.A) would seem to require, if nothing else, the identification of activity states of students in the sample at three points in time. This determination, however, presented one of the major problems encountered in file preparation. The difficulties stemmed primarily from the many different combinations of data sources potentially available for any one student.

The simple classification of in-school or out-of-school is too limited to truly depict the dynamics of an individual's transition through the educational system. The more complete classification system used for analysis is sketched below.

In classifying individuals as to activity state, two or more classifications were used. The primary classification was strictly related to the time points considered in the study (i.e., fall 1973; spring 1974; and fall 1974), and related primarily to in-high-school or out-of-high-school status. The second (or third or fourth) classification areas are conditional on the primary classification and provide in some cases historical information. The secondary classifications used related to: work status, grade in high school, postsecondary education (PSE) status, highest grade completed, and status regarding high school equivalency programs (HEP).

Information relating to the particular mode of classification at a single time point was often obtainable from diverse sources, but was not in all cases available. When information was available from several sources, there was not always complete agreement as to classification from the different sources. A complete listing of potential sources of data from which a student's status might have been determined is given in Appendix E. Additionally, the systems by which activity states were determined are included in Appendix E in the form of decision trees. An example of this system for the simplest time point classification (CS students in fall 1973) is shown in Figure 2.7.

For a given time point there are various sources of information regarding an individual's activity state, as can be seen from Figure 2.7. Different instruments or questions within instruments provide one dimension of source differences, while different persons from whom the data are obtained is another dimension. Within the FSQ telephone followup data, the second dimension exists within a specific instrument; in all other cases, a particular source is associated with a specific instrument. One may observe the implied hierarchy of data sources used in determining activity state from the example shown in Figure 2.7. In assigning high school status, for example, the order of acceptance of information from various data sources is:

(1) High school staff.

(2) Respondent.

(3) Respondent's spouse.

(4) Respondent's parents.

(5) Friend.

(6) Project staff (for UB participants only).

An ordering of data sources regarding other aspects of each student's activity state (secondary classifications other than grade level or highest grade completed) is similar to that given above except that high school staff (normally unfamiliar with student's activities after he leaves school) were given lowest priority. A specification of such implied hierarchies of data sources is given in Appendix E. Actually all available information relative to an activity state was examined. The classification was determined from the highest ordered data source from which classification information was obtainable. In addition to the standard lead digit codes, coded activity state information was

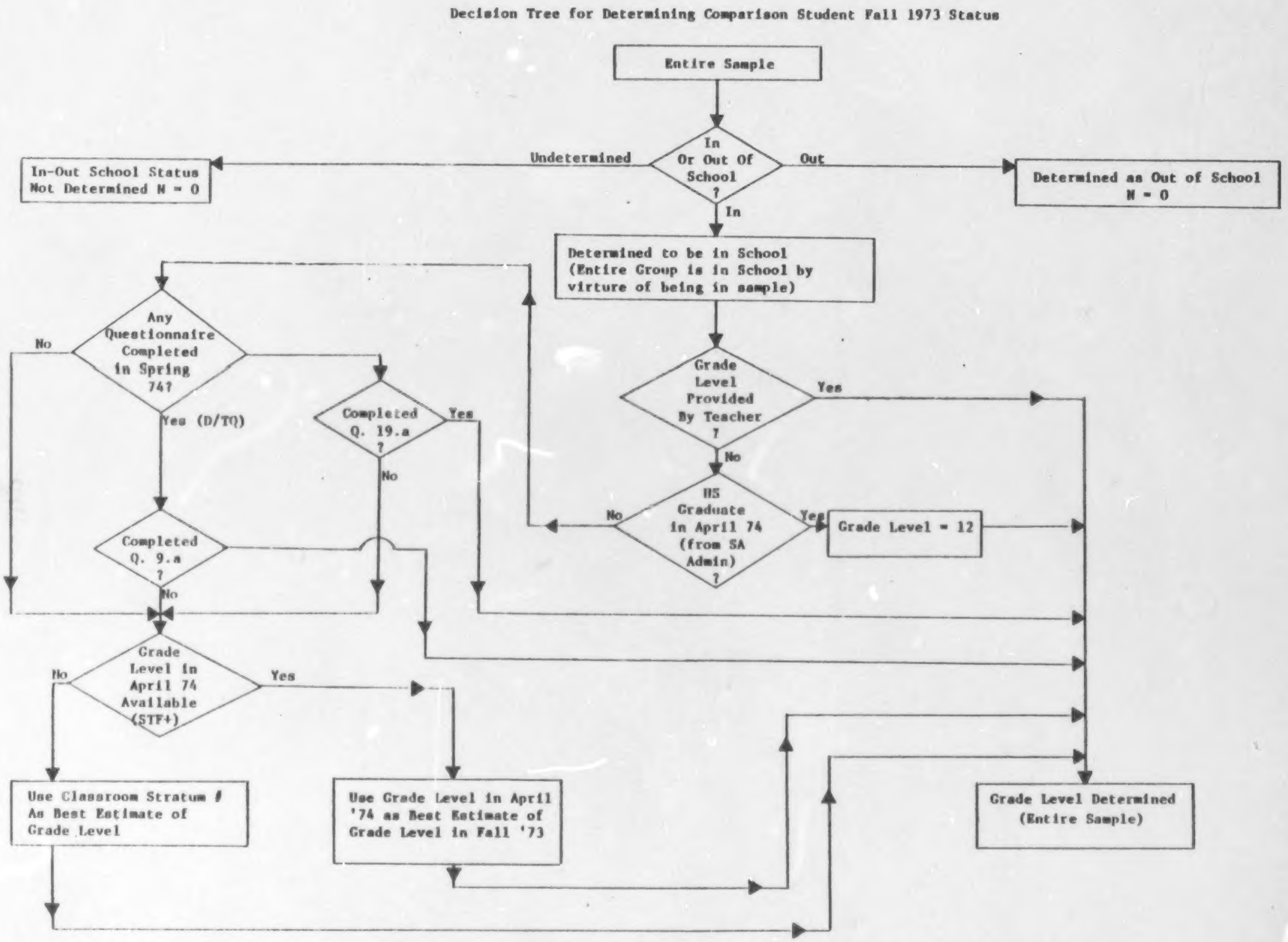

Decision Tree for Determining Comparison Student Fall 1973 Status
Entire Sample
In Or Out Of School ?
Undetermined
Out
In
In-Out School Status Not Determined N = 0
Determined as Out of School N = 0
Determined to be in School (Entire Group is in School by virture of being in sample)
Grade Level Provided By Teacher ?
Yes
No
HS Graduate in April 74 (from SA Admin) ?
No
Yes
Grade Level = 12
Any Questionnaire Completed in Spring 74?
No
Yes (D/TQ)
Completed Q. 19.a ?
Yes
No
Completed Q. 9.a ?
No
Grade Level in April 74 Available (STF+)
No
Yes
Use Classroom Stratum # As Best Estimate of Grade Level
Use Grade Level in April '74 as Best Estimate of Grade Level in Fall '73
Grade Level Determined (Entire Sample)

Figure 2.7. Decision Tree for Determining Comparison Student Fall 1973 Status.

also supplemented by additional codes: (1) a code indicating the source from which the classification is made, (2) an inconsistency code indicating whether the classification was consistent with all other available data within the time period.

In addition to inconsistencies within a specific time point, there are additional inconsistencies that resulted from classifications at two or more time points. For example, the classification "In High School Grade 10" in fall 1973 is inconsistent with the classification "Graduated High School" in spring 1974. Moreover, it was possible to impute responses at one time period from those at another (some approaches have already been specified above). Examples of some straightforward imputations are:

(1) "Graduated in spring 1974" would suggest a grade level of 12 in fall 1973 if the individual could be identified as being in high school at the earlier time (similarly for fall 1974 and spring 1974).

(2) "In grade n in fall 1973" or "spring 1974" would normally indicate the student was in the same grade at the other time period (provided he was in high school at both points).

When imputations were performed, the appropriate imputation code was added to the data element so imputed. Inconsistencies across time periods were noted by the supplemental inconsistency code specified in the previous section.

2. Determining Other Critical Variables for Analyses

In addition to determining primary and secondary activity states at three points in time, it was important for the overall student analysis to determine other classificatory variables for the respondents. Specifically, the remaining classificatory variables among the common data items are sex, age, race, and poverty index. Further, information relating to high school courses played a major part in these analyses. Finally, it was important to ascertain whether: (a) students in the UB sample were, in fact, UB participants at the three discrete time points; (b) students in the CS sample had participated in UB either before or after selection; and (c) the length of participation for UB students. These important determinations are detailed in Appendix E.

Chapter 3

Overview of Analysis: General Approach and Limitations

I. GENERAL

In previous chapters, the nature and methodology of the collection and processing of student and project data have been sketched. This chapter provides an overview of analyses that were performed and the various procedures used to extract the most important and relevant information from the data. This chapter also provides an insight into analysis limitations through an appraisal of the quality of data returned, including examinations of nonresponse, reliability, and basic differences between certain respondent subgroups.

To guide analysis, an analysis advisory group was formed, consisting of nationally prominent analysts (see Appendix H). RTI submitted to USOE on 5 December 1974 an analysis plan, which was modified somewhat as a result of a meeting of RTI staff, USOE project monitors, and the analysis advisory group on 10 and 11 December 1974. While the advisory group provided thoughtful insight into analysis problems and strategies, many of the valuable suggestions offered by the group could not be implemented due to constraints on the data (see Chapter 2, Section VII) and limitations in time and funds. Where possible, suggestions were incorporated into the analyses. Although the advisory group provided valuable input into the plans for analysis, they served in a purely advisory capacity and the resultant analysis strategy is the sole product and responsibility of the RTI analysis team.

In addition to routine analyses for questionnaire and item nonresponse, data reliability, and subgroup bias (presented in this chapter), there are three major classes of analysis: (a) student oriented analyses, (b) program oriented analyses,[1/] and (c) project by student analyses. General features

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[1/] This analysis class subsumes the project staff analyses and the project specific analyses introduced in subsection VIII.B of Chapter 2.

of these classes are given below, while specific analyses and results are presented in detail in subsequent chapters.

A. Student Oriented Analyses

The most general questions concerning UB and control students are examined in the student oriented analyses which are presented in Chapter 7. In these evaluations the unit of analysis is the student, and analysis variables are typically those common to all students (see subsection VII.A of Chapter 2) which subsequently comprised the major portion of the Student Master File.[2/] The analyses are conceptually quite straightforward although in some cases they become operationally complex. They focus primarily on differences between UB participants and nonparticipants.

These analyses speak to the critical questions of the effectiveness of the UB program. The questions to be answered are value-laden and necessarily sensitive ones, and every effort has been made to insure that misinterpretations do not occur from spurious results. Analysis bias, either favorable or unfavorable to the program, has been avoided to the greatest extent possible. For these analyses, therefore, appropriate adjustments of data were quite crucial. Extensive care has been taken to adjust, where possible, for any existing differences between participants and nonparticipants in terms of variable classes not directly pertaining to program participation (i.e., moderating variables such as differential baseline measures and/or differential operation of relevant external processes), as suggested by the process model.

The approach in selecting comparison students reduced some of the major differences between UB participants and comparison students along two major dimensions--poverty level and "academic risk" status--thus reducing the extent to which statistical adjustments were required. Techniques for such adjustments, particularly in the case of differences between participants and nonparticipants on large numbers of basically qualitative variables, become quite complex.[3/] For this reason, the sampling plan was designed to

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[2/] The Student Master File is discussed more fully in Section IV of this chapter and in Appendix E.

[3/] See Appendix F for specific adjustment techniques used for student analyses.

reduce the probability of major group differences in such critical variables as: class in school, region of country, rural-urban location, poverty status, and classification as "academic risk" (see Chapter 2, subsection IV A and Appendix B). In the main, the sampling plan was effective toward this end.

B. Program Oriented Analyses

In the program oriented analyses, reported in Chapters 4 through 6, the thrust is descriptive. These descriptive analyses are divided into three sections. One section uses the individual project staff as the units of analysis (Chapter 4). The directors, instructors, and counselors, as well as their activities over all the sampled projects are described. This organization of the data allows the investigation of questions regarding the characteristics of staff members for the UB program in general. Within this framework, estimates of national characteristics of UB staff members are produced.

The second portion of the descriptive analyses (Chapter 5) concerns the project. Data are aggregated over the individuals of a given staff category within a given project to determine global aspects of project organization without regard to individual staff members.[4] For these analyses, indices of project variables were developed by combining certain questionnaire items and subitems within the three project staff questionnaires.[5]

The third portion of the analysis (Chapter 6) examines perceptions of the program by the UB participants. Since no CS group data are used, these analyses concentrate on those portions of questionnaire data that are not common between the CS and UB group. Such data are typically the impressions of UB students regarding the UB program or their specific project.

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[4] Since there was but one director in each project, aggregation was unnecessary for that staff category. For the counselor and instructor staff categories, however, there was potentially more than one set of responses for a given project (e.g., more than two instructors were sampled and responded to the PIQ). Where this was the case, an aggregate of counselor and instructor responses to a particular questionnaire item was computed, and this single response was used as "the response" from that staff category within that project (see Appendix G for a more detailed discussion of the aggregation procedures).

[5] The rationale and procedures used in the reduction of several items or subitems into more general variates are described in Appendix G.

C. Project by Student Analyses

A final class of analyses focuses on an investigation of relationships between a set of variables reflecting project structure and function and the sets of student input and output measures. Results of these analyses are reported in Chapter 8. Project variables were derived by further aggregation of questionnaire results over staff categories[6] or from items unique to specific staff categories (e.g., level of experience of project instructors). Student data for a given project were collapsed into a set of measures aggregated over the students of that project, providing a single value for each project on each student variable considered. The aggregate measures were computed from the data items common to all UB students over the various UB instruments (see Appendix G for procedures used). These aggregate student measures, classified by various project dimensions were then examined. This class of analysis allows a broad variety of questions relating to "project effect" to be posed and investigated.

In the project by student analyses, concern shifts from the national program effectiveness to differences in project outcomes as associated with structural and/or functional project differences. This entire class of analysis evaluates differential program operation. As such, it examines the relative value of particular approaches to the general UB objectives. The question of the value of program participation *per se* is treated in the student oriented analyses.

D. Other Preliminary Data Examinations

In addition to these three classes of analysis, other routine analyses were conducted. In order to provide accurate estimates for the major analysis classes, the data were frequently adjusted for nonresponse (see

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[6] The commonality of items over staff questionnaires, discussed in subsection VII.D of Chapter 2, allowed such aggregation. Appendix G gives details of the procedures used in obtaining these aggregates.

Appendix F); therefore examinations of both item and instrument nonresponse were conducted to guide these subsequent adjustments. An examination of data reliability was also undertaken, and studies were conducted to investigate possible biases due to self selection in certain analyses that were restricted to subsets of students. All such studies are presented below in this chapter (Sections III, IV, V, and VI).

II. ORGANIZATION OF ANALYSIS: SPECIFIC ANALYSIS QUESTIONS

In general, the organization of data analysis follows the partitioning sketched in Section I, but within each category of analysis (analysis class) there are further classifications leading to specific sets of analysis questions, or hypothesis, to be addressed. This approach was dictated by several constraints on analysis planning. First, both time and budget constraints prevented an extensive data oriented analysis[7/] of the student data, and, secondly, the nature of much of the data collected by this design did not facilitate a data oriented analysis. The balance that has been struck between an hypothesis testing approach and an hypothesis generating approach is probably a good one for this study. More extensive "data-snooping" and attempts at empirical scale construction within the student analyses might have proved fruitful; but in a study where major emphasis centers about a few key issues, hypothesis testing should be the major concern.

Given these considerations, the analysis, in general, specified _a priori_ classifications of variables or research questions. The nature of these questions and the data sources allowing their investigation prescribed the final determination of analysis organization and schedule.

The outline presented in Table 3.1 details the specific list of research questions investigated. In addition to the questions, the data required for an answer and the chapter of the report in which the questions are addressed are shown in Table 3.1. For simplicity of presentation

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[7/] A data oriented analysis is one that examines the data without _a priori_ hypothesis. For example, many factor analytic or multidimensional scaling studies approach the data to find what is there in terms of data structure or data relationships.

Table 3.1

AN OUTLINE OF ANALYTIC QUESTIONS

Question and Chapter Reference	Minimal Data Needed and Source[a]	Moderator Variables[b]
I. Questions Concerning Entire Student Group		
A. Is educational continuance, including PSE entry for seniors, a function of UB participation? (Chapter 7)	Educational status at three points, extent of UB participation (Master File).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
B. Is academic GPA change a function of UB participation? (Chapter 7)	Status in fall 1973, extent of UB participation (Master File); GPA information for Grade 9 and current grade (STF).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
C. Is course type change (nonacademic--academic) a function of UB participation? (Chapter 7)	Status in fall 1973, extent of UB participation (Master File; course type for Grade 9 and current grade (STF).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
D. Is academic course level change (remedial—general--advanced) a function of UB participation? (Chapter 7)	Status in fall 1973, extent of UB participation (Master File); course level for current grade (STF).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
II. Questions Concerning Specific Student Subgroups (Not Completely Questionnaire Dependent)		
A. What, if any, are the effects of UB participation upon those students who drop out of high school? (Chapter 7)	Extent of UB participation, status at three points in time, HEP[c] status spring 1974 and fall 1974 (Master File).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
B. Is the type of PSE entered by high school graduates a function of UB participation? (Chapter 7)	Extent of UB participation, school status at three points (Master File), types of PSE entered (FSQ).	Poverty Index, Academic Risk Index, Sex, Race (Master File).
III. Questions Regarding Subgroups Defined by Specific Questionnaire Completion		
A. BSQ Respondents		
1. What are the similarities and differences between UB and CS students in terms of important background variables? (Chapter 7)	Extent of UB participation (Master File); participation in other programs (Q. 24,25); parental education and occupation (Q. 17, 18); parental aspirations for student's education (Q. 32); type of community (Q. 10); type of study program in Grade 9 (Q. 20).	Sex, Race, Grade (fall 1973), Age, Academic Risk Index, Poverty Index (Master File).
2. What are the relationships of UB participation to: self-esteem and locus of control, educational and occupational aspirations? (Chapter 7)	Extent of UB participation (Master File); self-esteem (Q. 28); locus of control (Q. 29); educational aspiration (Q. 30,36); occupational aspiration (Q. 34,35).	Sex, Race, Grade (fall 1973), Age, Academic Risk Index, Poverty Index (Master File).
3. For 11th and 12th graders only: What are the relationships between UB participation and PSE plans and actions taken? (Chapter 7)	Extent of UB participation (Master File); actions regarding PSE (Q. 38,40); types and number of schools applied to (Q. 41,44); acceptance to PSE (Q. 42,43); application for and obtaining of financial aid (Q. 45-50).	Sex, Race, Grade (fall 1973), Age, Academic Risk Index, Poverty Index (Master File).
B. BSQ-B Respondents (UB only)		
How is the UB program perceived by participants? (Chapter 6)	Source from which first heard of UB (Q. 51); activities available, engaged in, and perceived helpfulness (Q. 55); others' perception of self (Q. 56); family effect (Q. 57); evaluation of components (Q. 59,60,64,65); benefits (Q. 61); extent of UB participation (Q. 52).	None.

- continued -

Table 3.1 (continued)

Question and Chapter Reference	Minimal Data Needed and Source[a/]	Moderator Variables[b/]
C. Reliability Studies		
1. Is the April 1974 school status reported on BSQ comparable to that recorded on other instruments? (Chapter 3)	April 1974 school status (BSQ); April 1974 school status (STF and SARF).	None.
2. Is school status for fall 1973 reported on BSQ comparable to that previously reported on project roster (or for CS, by high school on HSCR)? (Chapter 3)	Fall 1973 school status (BSQ); Fall 1973 school status (PRV or HSCR).	None.
3. Are D/TQ(C) responses to school status in fall 1973 consistent with the PD report of fall 1973 status on project roster? Are D/TQ(C) responses to school status in spring 1974 consistent with project staff responses reflected on the SARF or the STF? (Chapter 3)	School status fall 1973 and spring 1974 (D/TQ(C)); school status fall 1973 (PRV); school status spring 1974 (SARF); school status spring 1974 (STF).	None
4. Are D/TQ(B) responses to school status in fall 1973 consistent with the status as reported on project roster (UB only)? Are D/TQ(A or B) responses to school status in spring 1974 consistent with school status as reported on SARF or the STF? (Chapter 3)	School status fall 1973 and spring 1974 (D/TQ(A&B)); school status fall 1973 (PRV): school status spring 1974 (SARF); school status spring 1974 (STF).	None.
5. Are FSQ(UBB) response to school status in fall 1973 consistent with the status as reported on project roster (UB only)? Are FSQ(B) responses to school status in spring 1974 consistent with status as reported on SARF or STF? (Chapter 3)	School status fall 1973 and spring 1974 (FSQ(B)); school status fall 1973 (PRV); school status spring 1974 (SARF); school status spring 1974 (STF).	None.
IV. Questions Regarding Comparison of Sub-Groups Defined by Specific Questionnaire Completion (Indicators of Analysis Biases)		
A. Are characteristics of BSQ(B) respondents different from absentees who subsequently respond to D/TQ(C)? (Chapter 3)	Age, sex, race, poverty status, grade level, school status in fall 1973 and spring 1974 (Master File).	None.
B. Are characteristics of BSQ respondents different from D/TQ(A&B) respondents? (Chapter 3)	UB participation status; age, sex, race, poverty status, grade level, school status, in fall 1973 and spring 1974 (Master File).	None.
C. Are characteristics of BSQ or D/TQ respondents different from those of FSQ(B) respondents? (Chapter 3)	Age, sex, race, poverty status, grade level, school status in fall 1973 and spring 1974 (Master File).	None.
D. Are characteristics of BSQ or D/TQ respondents who do respond to FSQ(A) different from those who do not respond to FSQ(A)? (Chapter 3)	Response status for FSQ(A) (Master File); age, sex, race, poverty status, grade level, school status in fall 1973 or spring 1974 (Master File).	None.
V. Questions Concerning Descriptive Characteristics of UB Project Staff (Directors, Instructors, Counselors)		
A. Project Directors[d/]		
1. What are the demographic characteristics of the project directors? (Chapter 4)	Age (2A); sex (2B); race (3); community background (5); family background (6,7).	None.

- continued -

Table 3.1 (continued)

Question and Chapter Reference	Minimal Data Needed and Source[a/]	Moderator Variables[b/]
2. What is the average and range of experience and training for UB directors? (Chapter 4)	Experience with disadvantaged students (1B,1C); degree level (8); current enrollment (10); special training (11A,11B).	None.
3. What are the attitudes of the project directors on issues that have impact on educational intervention programs? (Chapter 4)	Philosophy of education (23); attitudes toward students (34).	None.
4. How do project directors divide their time in running a project? (Chapter 4)	Breakdown of time spent (18).	None.
B. Project Instructors[e/]		
1. What are the demographic characteristics of the instructors? (Chapter 4)	Age (1); sex (2); race (3); community background (5); family background (6,7).	None.
2. What is the average and range of experience and training for UB instructors? (Chapter 4)	Training (8,10,11,12,23A); experience (13, 14A,15).	None.
3. What are the attitudes of the instructors with respect to issues that impact on educational intervention programs? (Chapter 4)	Philosophy of education (29); attitudes toward students (35); importance of what they teach (30).	None.
4. How is the time of the instructors broken down and how much time is devoted to teaching? (Chapter 4)	Time breakdown (26); part-time/full-time (16A,16B); other employment (17); number of classes taught (20B); techniques used (28).	None.
C. Project Counselors[f/]		
1. What are the demographic characteristics of UB counselors? (Chapter 4)	Age (1); sex (2); race (3); community background (5); family background (6,7).	None.
2. What is the average and range of experience and training of UB counselors? (Chapter 4)	Degree level (8) current enrollment (10); special training (11A,11B); counseling training (12,13,14,15A,16).	None.
3. What are the counselor attitudes with respect to issues that impact on educational intervention programs? (Chapter 4)	Philosophy of education (30); attitudes toward students (34).	None.
4. How is the counselor's time spent in a UB project? (Chapter 4)	Full-time/part-time (17); time breakdown (23); guidance breakdown (24); work load (25); length of counseling sessions (26); number of sessions/students (27).	None.
VI. Descriptive Questions Concerning Projects		
A. What are the demographic characteristics of the project? (Chapter 5)	Age of projects (PDQ 1A); average monthly enrollment (PDQ 41B); project emphasis (PDQ 17,22; PCQ 20; PIQ 25).	None.
B. What are the costs and staffing patterns of projects? (Chapter 5)	Project Costs (PDQ 38, 40, 41); project staffing (PDQ 19, 20) 39.	None.
C. How do the projects differ in their sponsors, their kind of sponsorship, and their committee structure? (Chapter 5)	Project sponsorship (PDQ 12A,13,14,26); Relations with high schools and PSE groups (PDQ 31; PCQ 33; PIQ 39A); committee structures (PDQ 24,25,27).	None.

- continued -

Table 3.1 (continued)

Question and Chapter Reference	Minimal Data Needed and Source[a]	Moderator Variables[b]
C. How well do the projects interact with the community, with their students, and among their staff? Do projects differ as to project relations: staff/staff; staff/students; staff/community? (Chapter 5)	Staff/staff (PIQ 37,38; PDQ 28; PCQ 31,32); staff/community (PDQ 25,26,27); staff/students (PDQ 28; PIQ 35,38; PCQ 32,34); students/students (PDQ 28; PIQ 38; PCQ 32).	None.
VII. Questions Concerning Student Output Variables Classified by Student Input Variables and Project Characteristics		
A. Using the project as the unit of analysis, what are the salient[g] characteristics of the UB projects?[h] (Chapter 8)	Project size; staff training, experience, education, activities, attitudes, philosophy.	None.
B. What is the distribution of student input and output variables over projects?[i] (Chapter 8)	Student input variables--academic, sex, poverty status, grade level fall 1973 (Master File); student output variables--PSE rates, academic change, HS continuance rates (Master File).	None.
C. What relationships, if any, hold among project characteristics, student input measures, and student output measures? (Chapter 8)	Student input and output measures (See VII.B); project characteristics (See VII.A).	None.

[a] Following the lists of variables required to answer a specific analysis question, the source (questionnaire, file or item number) from which the data are obtained is given in parentheses.

[b] List of variables for which statistical control was used in answering the specific analysis question. The source of such data is given in parentheses.

[c] High School Equivalency Program.

[d] All item numbers refer to the PDQ.

[e] All item numbers refer to the PIQ.

[f] All item numbers refer to the PCQ.

[g] Using data aggregated over respondents within a specific staff category and project.

[h] Using data from composite by project of counselor, instructor, and director data.

[i] Using student data aggregated within project.

(rather than theoretical demands), the analysis questions have been outlined according to the sources of data required (see Chapter 2, Section VII). Question-grouping I contains questions concerning the entire student sample (Upward Bound and Comparison Students), drawing upon the Student Master File.[8/] Grouping II contains questions regarding specific student subgroups, for which data is obtainable from various student questionnaires. Grouping III contains questions dealing with student subgroups defined by their completion of specific student questionnaires. Grouping IV contains questions involving the comparison of different student subgroups, defined by different student questionnaires. Grouping V contains questions concerning characteristics of Upward Bound project staff, as defined by specific staff questionnaires. Grouping VI contains questions regarding projects, as defined by data obtained from various staff questionnaires. Finally, Grouping VII contains questions concerning the relations of project characteristics to student outcomes, drawing upon various staff and student questionnaires.

III. INSTRUMENT RETURN RATES AND DATA QUALITY

Analysis plans for this study were formulated with the expectation that data for all individuals in the sample would not be available due to instrument (questionnaire) and item nonresponse. The extent of questionnaire nonresponse can, of course, influence the validity of results, since self selection, in the form of questionnaire return, may produce data for a very biased subset of the sample. Within the subset of eligible sample members returning questionnaires, omission of items, failure to follow instructions, and logical inconsistencies in item responses provide additional sources of data deterioration which may affect the results obtained. In an attempt to resolve some of the problems of missing data, imputation procedures were implemented,[9/] and while the net gain from such procedures should be positive, it is possible that imputations introduce

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[8/] See Sections VII and VIII of Chapter 2 and Appendix E for discussion of the common variables available to all students.

[9/] See Chapter 2, subsection VIII.B, and Appendix E for discussion of imputation procedures.

some error into the data for some individuals. An examination of these various sources of potential error is the subject of this section.

A. Student Sample Size

The student sample sizes employed in this study are given in Table 3.2 by project and by feeder school[10] within project. The table provides both "original" and "corrected" sample sizes. The original sample size is the number selected by RTI on the basis of information provided by the projects (on the PRV) or the feeder high schools (on the HSCR). When field administration of questionnaires commenced, certain discrepancies in the original sampling rosters were noted, and corrections were made, yielding the corrected figures. The UB sample, as originally drawn, numbered 3747. A total of 83 students were deleted from the original sample roster because they had been misclassified as to project membership on the PRV.[11] A total of 46 students were added because they had been incorrectly omitted from the PRV yielding a final total of 3710 UB students in the sample.[12] The original CS sample totalled 2401. From this total, 61 students were deleted because they were identified as Upward Bound participants,[13] or because they were found to be special education or homebound students.

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[10] Recall that a feeder school has been defined basically as a high school sending students to an Upward Bound Project (Section IV.A of Chapter 2).

[11] Misclassifications included duplicate roster entries and inclusion of names of students no longer in the program at the stipulated time period (fall 1973). Only a small proportion of this number resulted from errors by project staff in completing the PRV. The bulk of errors resulted from: (a) use of uncorrected rosters provided by USOE for those projects not responding with a corrected roster, and (b) data entry errors at RTI creating duplicate listings.

[12] These errors of omission resulted in more or less equal numbers from errors made by project staff in completing the PRV and from use of uncorrected rosters for projects not returning the PRV.

[13] Although high school staff members were asked to exclude from sampling lists those students who had participated in UB, this type of error was anticipated. It was unreasonable to expect that all high school staff members would be aware of the UB membership status of every student in school.

Table 3.2

ORIGINAL AND CORRECTED STUDENT SAMPLE SIZES

Project Number	CB Sample				Comparison Sample														
					Feeder School 1			Feeder School 2			Feeder School 3			Feeder School 4			Total		
	Original	Deletions	Additions	Final	Original	Deletions	Final	Original	Deletions	Final	Original	Deletions	Final	Original	Deletions	Final	Original	Deletions	Final
1	76	1	0	75	21	0	21	21	3	18	—	—	—	—	—	—	42	3	39
2	64	1	0	63	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
3	66	2	0	64	21[a]	0	21	21	0	21	—	—	—	—	—	—	42	0	42
4	149	47[b]	2	104	—	—	—	30	1	29	—	—	—	—	—	—	30	1	29
5	81	0	0	81	21	0	21	22	1	21	—	—	—	—	—	—	43	1	42
6	83	0	0	83	42	2	40	—	—	—	—	—	—	—	—	—	42	2	40
7	113	0	0	113	23	0	23	22	0	22	—	—	—	—	—	—	45	0	45
8	133	0	0	133	21	0	21	—	—	—	—	—	—	22	0	22	43	0	43
9	76	0	0	76	21	0	21	24	3	21	—	—	—	—	—	—	45	3	42
10	74	2	0	72	21	0	21	21	1	20	—	—	—	—	—	—	42	1	41
11	39	0	0	39	—	—	—	—	—	—	—	—	—	—	—	—	0[c]	0	0
12	39	1	0	38	22	0	22	21	1	20	—	—	—	—	—	—	43	1	42
13	65	0	0	65	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
14	81	0	0	81	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
15	84	0	0	84	21	0	21	21	0	21	21	1	20	—	—	—	63	1	62
16	53	1	0	52	22	1	21	21	0	21	—	—	—	—	—	—	43	1	42
17	19	1	0	18	21	2	19	21	0	21	—	—	—	—	—	—	42	2	40
18	66	0	0	66	21	0	21	21	2	19	—	—	—	—	—	—	42	2	40
19	67	0	0	67	21	0	21	21	0	21	21	0	21	—	—	—	63	0	63
20	48	0	0	48	21	0	21	—	—	—	—	—	—	21	1	20	42	1	41
21	95	0	2	97	21	3	18	21	0	21	—	—	—	—	—	—	42	3	39
22	26	0	0	26	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
23	125	0	0	125	21	1	20	21	0	21	—	—	—	—	—	—	42	1	41
24	101	0	0	101	21	1	20	21	0	21	—	—	—	—	—	—	42	1	41
25	174	0	0	174	21	0	21	21	0	21	21	0	21	21	2	19	84	2	82
26	93	2	3	94	21	1	20	21	2	19	—	—	—	—	—	—	42	3	39
27	31	0	9	40	21	1	20	21	0	21	—	—	—	—	—	—	42	1	41
28	82	9	1	74	21	0	21	22	0	22	—	—	—	—	—	—	43	0	43
29	60	0	0	60	42	0	42	—	—	—	—	—	—	—	—	—	42	0	42
30	66	2	5	69	42	1	41	21	0	21	21	0	21	—	—	—	84	1	83
31	77	2	0	75	42	0	42	—	—	—	—	—	—	—	—	—	42	0	42
32	47	0	0	47	21	1	20	21	0	21	—	—	—	—	—	—	42	1	41
33	67	0	1	68	21	0	21	21	2	19	—	—	—	—	—	—	42	2	40
34	90	6	0	84	21	1	20	22	2	20	—	—	—	—	—	—	43	3	40
35	76	1	0	75	21	2	19	22	0	22	—	—	—	—	—	—	43	2	41
36	41	0	12	53	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
37	40	0	0	40	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
38	55	0	0	55	22	1	21	—	—	—	—	—	—	22	0	22	44	1	43
39	49	0	0	49	22	0	22	21	0	21	—	—	—	—	—	—	43	0	43
40	77	0	0	77	21	0	21	21	0	21	—	—	—	21	2	19	63	2	61
41	50	0	0	50	22	0	22	22	0	22	—	—	—	—	—	—	44	0	44
42	70	0	0	70	22	2	20	21	0	21	—	—	—	—	—	—	43	2	41
43	75	1	5	79	22	1	21	21	2	19	—	—	—	—	—	—	43	3	40
44	36	0	1	37	21	1	20	21	0	21	—	—	—	—	—	—	42	1	41
45	112	0	3	115	—	—	—	20	0	20	21	0	21	21	2	19	62	2	60
46	41	1	0	40	21	1	20	21	1	20	—	—	—	—	—	—	42	2	40
47	53	0	0	53	21	1	20	21	2	19	—	—	—	—	—	—	42	3	39
48	42	0	0	42	—	—	—	21	0	21	21	0	21	—	—	—	42	0	42
49	0	0	0	0[d]	21	3	18	21	0	21	—	—	—	—	—	—	42	3	39
50	72	2	0	70	21	2	19	21	0	21	—	—	—	—	—	—	42	2	40
51	123	0	2	125	21	0	21	21	1	20	—	—	—	—	—	—	42	1	41
52	64	1	0	63	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
53	32	0	0	32	21	0	21	21	0	21	—	—	—	—	—	—	42	0	42
54	29	0	0	29	42	0	42	—	—	—	—	—	—	—	—	—	42	0	42
TOTALS	3767	83	46	3710													2401	61	2340

[a] School refused but 21 students were to be selected.

[b] The largest part of this number represents duplicated listings.

[c] No feeder school defined for this project.

[d] New project, no clients in September-October 1973.

Hence, the final CS sample was 2340. From Table 3.2, it can be seen that with the exception of project number 4, in which a large number of students were deleted from the original roster due to an data-entry error creating duplicate roster listings, there are no marked differences among projects or feeder schools in numbers deleted or added to the original roster.

B. Instrument Return Rates

Return rates for the various questionnaires as well as properties of the distribution of return rate by project are reported in Table 3.3. The properties of the return rate distribution which are presented are the minimum, the first quartile (Q1), the second quartile (Q2), the third quartile (Q3), and the maximum.[14/] All instrument return rates were determined on the basis of "eligible"[15/] respondents. Because of the complex questionnaire administration--overlapping populations, subsampling, differences in time of administration, and differences in mode of administration--differing return rates were expected, and thus comparison of return rates across instruments provides little useful information. Followup instruments (such as D/TQ(C) and Form B of the FSQ), mailed to students who had previously not responded, were expected to yield low return rates. The decision to subsample in the telephone followup instruments deflated the FSQ telephone administration return rates (i.e., not all eligibles were subsampled for administration, but among those who were sampled, the response rate was greater than 95 percent). The return rate for the STF is

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[14/] Q1 is the point in a distribution above which 75 percent of the cases fall and below which 25 percent of the cases fall. Q2 (the median) is the point in a distribution above which and below which fall 50 percent of the cases. Q3 is the point in a distribution above which 25 percent of the cases fall and below which 75 percent of the cases fall.

[15/] Not all sampled students were eligible for administration of all student instruments (see Chapter 2, Figure 2.5). For example, only those students still in the UB project at the time of administration were eligible for the BSQ(B). And only those no longer with the project were eligible for the D/TQ(B). The use of such eligibility requirements provides a more realistic picture of response rates.

Table 3.3

INSTRUMENT RETURN RATES

Instrument	Number Eligible	Percent Return For All Eligibles	Distribution of Percent Return by Project[a]				
			Minimum	Q1	Q2	Q3	Maximum
PDQ	54	88.9%	—	—	—	—	—
PIQ	211	72.9	25.0%	50.0%	77.5%	100.0%	100.0%
PCQ	104	80.8	0.0	50.0	100.0	100.0	100.0
STF(A)[b]	2340	99.1	50.0	100.0	100.0	100.0	100.0
STF(B)[c]	3710	100.0	100.0	100.0	100.0	100.0	100.0
D/TQ(A)[b]	258	25.6	0.0	0.0	29.7	50.0	100.0
D/TQ(B)[c]	373	37.8	0.0	25.0	47.3	100.0	100.0
D/TQ(C)[c]	573	47.8	0.0	32.8	50.0	67.9	100.0
BSQ(A)[b]	2082	85.1	26.2	62.7	90.4	95.0	100.0
BSQ(B)[c]	3337	82.8	46.4	79.5	85.6	91.4	98.7
FSQ(UBA)[c] (mail)	3179	62.8	40.3	54.7	59.5	71.2	86.4
FSQ(UBB)[c] (mail)	531	22.0	0.0	8.6	21.4	29.4	100.0
FSQ(UBA)[c] (telephone)	1183	38.6	0.0	31.6	38.9	46.2	56.3
FSQ(UBB)[c] (telephone)	414	97.8	50.0	100.0	100.0	100.0	100.0
FSQ(CSA)[b] (mail)	1838	58.3	39.5	52.9	53.3	67.5	81.1
FSQ(CSB)[b] (mail)	502	15.5	0.0	4.7	15.8	25.0	50.0
FSQ(CSA)[b] (telephone)	767	38.3	16.7	30.8	36.6	47.5	72.7
FSQ(CSB)[b] (telephone)	424	90.6	0.0	100.0	100.0	100.0	100.0

[a] The distribution of return rate for specific instruments over projects is not based consistently on 54 projects, since not all projects would necessarily have eligible staff or students for some instruments. The least number of projects on which the distribution is based is 43 for the D/TQ(B).

[b] CS group instrument.

[c] UB group instrument.

artificially inflated in that some information (minimally the student's name) was available for all sampled individuals, and thus the form was completed and returned in virtually all cases.

Return rates for UB project staff questionnaires were generally acceptable. The lowest return rate (72.9 percent) was realized for project instructors. Complete[16/] staff data were available for only 18 projects (one-third of the projects sampled), although for 38 projects data were available for the project director and at least 50 percent of the counselors and instructors who were sampled. For the project by student analyses this nonresponse of project staff compounds the loss of student data. Indeterminate or missing project staff information preempted effective use of the aggregate student data for that project. Weighting adjustments[17/] for loss of project staff data in the project-based analysis presented in Chapter 4 provided an alternate treatment of the problem of staff nonresponse.

Student questionnaire return rates were also generally acceptable. Low return rates were experienced for D/TQ Forms A and B, but these were questionnaires mailed (without extensive followup) to those sample members who had left school or project and who were, as a result, difficult to locate and probably less motivated to respond. A low return rate was also experienced for the D/TQ(C), which was a mail followup instrument for UB participants failing to attend the BSQ(B) group administrations. The group toward which this questionnaire was directed had already demonstrated a low propensity to respond. The return rates to the mailed FSQ forms was about as expected (approximately 60 percent for previous respondents and about 20 percent for previous nonrespondents). Response to telephone followup for the FSQ were high, as expected. As noted previously, the return rate for the telephone followup for Form A reflects primarily the subsampling (only 40 percent for both CS and UB groups) and response rates among those sampled is actually closer to 95 percent. Total return rates for the FSQ forms, irrespective of mode of administration, may be obtained from the entries in

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[16/] All sampled staff members responding.

[17/] See Appendix F for techniques used in adjustment of sampling weights to compensate for nonresponse.

Table 3.3. Consider, for example, the case of the FSQ(UBA). From Table 3.3, it can be seen that 62.8 percent responded to the mail survey and that among the nonrespondents (37.2 percent) an additional 38.6 percent were contacted by telephone. The return rate for the FSQ(UBA) is therefore 100(.628 + (.386)(.372)) = 77.2%. Return rates for other FSQ forms are: FSQ(UBB), 98.3 percent; FSQ(CSA), 74.2 percent; FSQ(CSB), 92.1 percent.

Differences in return between UB and CS were, in general, small as seen in Table 3.3. Although not directly obvious from Table 3.3, complete student nonresponse (no available questionnaire data) was extremely low, only 0.2 percent for UB and 1.7 percent for CS. In other words, some questionnaire data were available for 99.8 percent of all UB students sampled and 98.3 percent of all CS students sampled. Considering only the fall 1974 data, no information was available for 19.8 percent of UB students and 21.9 percent of control students.

There is, as seen in Table 3.3, considerable variation over projects in return rates of student questionnaires. Minimum and maximum project response rates differ by at least 42 percent (FSQ(CSA)-mail) and at most 100 percent (FSQ(UBB)-mail). A more stable estimate of variation in project response rates can be obtained by the difference in the third and first quartiles of the response rate distributions. Using this index, greatest variability among projects is shown for the D/TQ, and the next greatest variation is for the mailed forms of the FSQ. The low overall return rate for the D/TQ and the differential return rate over projects suggests that analysis of these data could easily lead to spurious results, and for this reason, no analysis is based exclusively on D/TQ data.

C. Quality of Item Response (Questionnaire Data)

While response rates to the instruments define the upper limit of data availability, they do not by themselves give an accurate picture of the amount of indeterminate data for specific items of information within the questionnaires, nor do they indicate the quality of the data that has been made available. Substantial amounts of indeterminate data for a given item (or set of items), especially if it is differential with respect to important subgroups of respondents, would indicate a low degree of usefulness of the data for analyses, and possible bias in results.

The particular characteristic of data quality examined in this subsection are: (1) item nonresponse; (2) logical response inconsistencies; (3) inconsistent responses within routing patterns; and (4) out of range and multiple response. Also considered as an index of data quality for analysis purposes is the extent to which data were imputed. Since data imputations were performed by reason of nonresponse or multiple response, imputations did, in fact, represent questionable original data. To the extent that the imputations performed were logically and/or stochastically correct, the initial quality of the data has been improved.

The quality of questionnaire data is reported in two tables, reflecting the two ways of examining the data matrix of respondents and items. Table 3.4 gives information as to quality of data by items for each questionnaire examined. The entries for this table were determined by computing, for each item of a given questionnaire, the proportion of respondents exhibiting each of the five categories of questionable data quality. The resultant proportions define five frequency distributions (five proportions for each item) of item statistics within a given instrument. The minima (MIN), maxima (MAX), and quartiles (Q1, Q2, Q3) of these distributions are reported in Table 3.4. Consider, for example, the entries in Table 3.4 for nonresponse to the D/TQ(C). The tabled entries indicate that there was at least one of the 52 items for which there was complete response (minimum nonresponse of 0.0 percent). For one-fourth of the items (13 of the 52 items) nonresponse was 1.8 percent (5 of the 274 respondents) or less. For half of the items, nonresponse was 3.3 percent or less, and for only one-fourth of the items was nonresponse 10.2 percent or greater. The maximum nonresponse to any item was 16.8 percent.

Table 3.5 provides an examination of the same aspects of data quality of each questionnaire with the focus shifted to the individual. For each respondent, the proportion of questionnaire items exhibiting each of the five categories of questionable data quality was computed. The extremes and quartiles of these five frequency distributions of respondent statistics are the entries of Table 3.5. Considering again the entries for nonresponse to the D/TQ(C), the tabled entries are now interpreted quite

Table 3.4

PERCENTAGE OF RESPONDENTS WITH QUESTIONABLE DATA QUALITY FOR INDIVIDUAL QUESTIONNAIRE ITEMS

Instrument	Number of Items	Number of Respondents	Imputations					Indeterminate Data[a]					Skip Pattern Errors					Inconsistencies					Nonresponse				
			MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX
PDQ[b]	421	48	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.2%	0.0%	0.0%	0.0%	0.0%	27.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	4.2%	16.7%	100.0%[c]
FIQ	299	153	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	9.7	0.0	4.5	9.1	39.6	98.1[c]
FCQ	306	84	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	20.2	0.0	5.9	14.3	26.2	100.0[c]
D/TQ(A)[d]	35	67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	6.0	14.9	14.9	34.3	0.0	0.0	0.0	0.0	4.5	0.0	1.5	23.9	29.8	34.3
D/TQ(B)[e]	52	140	0.0	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	2.9	0.0	15.7	20.7	23.6	42.1	0.0	0.0	0.0	0.0	10.7	0.0	1.4	10.7	15.7	32.9
D/TQ(C)[e]	52	274	0.0	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.4	1.4	0.0	7.7	21.2	25.9	28.5	0.0	0.0	0.0	0.0	5.1	0.0	1.8	3.3	[illegible]	16.8
BSQ(A)[d]	202	1372	0.0	0.0	0.0	0.0	16.9	0.0	0.0	0.1	0.2	3.2	0.0	0.0	11.4	15.2	23.1	0.0	0.0	0.0	0.0	10.5	0.0	1.6	2.8	4.8	92.3[c]
BSQ(B)[e]	331	2763	0.0	0.0	0.0	0.0	17.0	0.0	0.0	0.1	0.2	4.5	0.0	0.0	0.0	10.6	20.2	0.0	0.0	0.0	0.0	15.9	0.0	2.9	5.0	8.6	99.5[c]
FSQ(UBA)[d] (mail)	21	1987	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	1.0	0.0	0.0	9.1	20.0	20.8	0.0	0.0	0.0	0.3	1.0	0.0	0.2	0.2	3.0	21.6
FSQ(UBB)[d] (mail)	29	114	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	22.8	23.7	0.0	0.0	0.0	0.0	0.0	0.9	3.5	4.4	4.4	34.2
FSQ(UBA)[d] (telephone)	21	455	0.0	0.0	0.0	0.2	0.7	0.0	0.0	0.0	0.2	0.9	0.0	0.0	0.9	3.3	3.7	0.0	0.0	0.0	0.0	0.9	0.2	0.7	1.1	4.0	13.0
FSQ(UBB)[d] (telephone)	29	405	0.0	0.0	0.0	0.2	1.0	0.0	0.0	0.2	0.5	0.7	0.0	0.0	0.0	7.2	8.6	0.0	0.0	0.0	0.2	0.7	0.0	3.2	5.2	6.9	30.9
FSQ(CSA)[e] (mail)	17	1086	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	1.6	0.0	0.0	11.9	14.3	14.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	16.6
FSQ(CSB)[e] (mail)	25	67	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	20.6	22.1	0.0	0.0	0.0	0.0	0.0	7.4	7.4	7.4	11.8	38.2
FSQ(CSA)[e] (telephone)	17	290	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.7	2.1	0.0	0.0	1.4	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.0	4.8	16.6
FSQ(CSB)[e] (telephone)	25	347	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	16.1	25.4	0.0	0.0	0.0	0.0	0.3	7.2	7.2	9.2	27.4	51.3

NOTE: For each questionnaire item, the percentage of respondents exhibiting specialized data problems was determined. Characteristics of the frequency distribution of these item statistics for the N items of a particular questionnaire are the entries of this table. Categories of questionable data are mutually exclusive. Unweighted data were used in computing tabled percentages.

[a] Indeterminate data includes multiple response and out of range data.

[b] Does not include cost analysis items.

[c] These maxima represent extreme cases, predominantly items allowing multiple open-ended responses where few individuals (or none) provided write-in responses for the final available option (see question 25 of the BSQ, Appendix D).

[d] CS group instrument.

[e] UB group instrument.

Table 3.5

PERCENTAGE OF ITEMS WITH QUESTIONABLE DATA QUALITY FOR INDIVIDUAL RESPONDENTS

Instrument	Number of Items	Number of Respondents	Imputations					Indeterminate Data[a]					Skip Pattern Errors					Inconsistencies					Nonresponse				
			MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX	MIN	Q1	Q2	Q3	MAX
PIK[b]	421	48	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	0.0%	0.0%	0.0%	0.7%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	10.9%	14.2%	16.9%	19.0%	27.3%
PIQ	299	153	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.3	3.3	0.0	0.0	0.0	1.0	10.4	0.0	0.0	0.0	0.0	6.0	5.4	15.0	22.7	30.1	65.2
PCQ	306	84	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.3	2.0	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	6.9	9.8	15.4	19.3	28.1	59.2
D/TQ(A)[c]	35	67	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	11.4	77.1	0.0	0.0	0.0	0.0	5.7	0.0	0.0	2.9	48.6	54.3
D/TQ(B)[d]	52	140	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	3.8	0.0	0.0	1.4	38.5	78.8	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.7	7.9	57.7
D/TQ(C)[d]	52	274	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	38.5	80.8	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	3.8	55.8
BSQ(A)[c]	202	1772	0.0	0.0	0.0	0.5	3.4	0.0	0.0	0.0	0.5	11.2	0.0	0.0	0.0	10.2	43.9	0.0	0.0	0.0	0.0	10.7	0.0	0.5	1.5	3.9	47.3
BSQ(B)[d]	331	2763	0.0	0.0	0.0	0.3	1.8	0.0	0.0	0.0	0.3	3.9	0.0	0.0	0.0	7.0	28.1	0.0	0.0	0.0	0.6	7.2	0.3	1.8	3.3	7.6	61.6
FSQ(UBA)[c] (mail)	21	1987	0.0	0.0	0.0	0.0	19.0	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.0	52.4	0.0	0.0	0.0	0.0	19.0	0.0	0.0	0.0	4.8	42.9
FSQ(UBB)[c] (mail)	29	114	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	31.0	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	6.9	96.6[e]
FSQ(UBA)[c] (telephone)	21	455	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.0	19.0	0.0	0.0	0.0	0.0	52.4	0.0	0.0	0.0	0.0	19.0	0.0	0.0	0.0	0.0	95.2[e]
FSQ(UBB)[c] (telephone)	29	405	0.0	0.0	0.0	0.0	20.7	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	37.9	0.0	0.0	0.0	0.0	12.9	0.0	0.0	0.0	13.3	72.4
FSQ(CSA)[d] (mail)	17	1086	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	58.8	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.3
FSQ(CSB)[d] (mail)	25	67	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	8.0	100.0[e]
FSQ(CSA)[d] (telephone)	17	290	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	29.4	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0[e]
FSQ(CSB)[d] (telephone)	25	347	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	44.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	4.0	32.0	100.0[e]

NOTE: For each respondent to a particular questionnaire, the percentage of items exhibiting specified data problems was determined. Characteristics of the frequency distribution of these respondent statistics for the N respondents to a particular questionnaire are the entries in this table.

[a] Indeterminate data includes multiple response and out of range data.

[b] Does not include cost analysis items.

[c] CS group instrument.

[d] UB group instrument.

[e] These maxima represent extreme cases in administration of the FSQ. Such cases were usually brought about when respondent was not contacted directly, but form was returned or answered by relative stating "Don't Know" to all or most of the questions.

differently. More than half of the 274 respondents responded to all 52 items of the questionnaire, and three-fourths of the respondents exhibited nonresponse of no more than 3.8 percent (2 of 52) of the items. The maximum individual nonresponse to items was 55.8 percent (29 of the 52 items).

As an aid in summarizing the data in Tables 3.4 and 3.5, the value of Q2 may be used as a representative value of the particular data problem for a given instrument and the difference between Q3 and Q1 may be used as a measure of variability. It should be pointed out, however, that certain categories of questionable data are restricted to limited subsets of items. Specifically, imputations are limited to the subset of items for which imputations were possible; skip pattern errors are limited to items within routing patterns; and logical inconsistencies are limited to those items which may generate inconsistent responses. The effect of these limitations is that of limiting the percent of total items for which such data problems can be observed. This serves to produce some artifactual results in terms of: (1) limiting, from above, the tabled entries for these categories in Table 3.5, and (2) generating a positive skew for the distribution over items of the percentages reported in Table 3.4. Since the limitations are somewhat different for each instrument, comparison of these categories over instruments may be misleading.

From the values of Q2 in Table 3.4, it can be seen that skip pattern error and nonresponse represent the largest data problems and that such data problems were greatest for the D/TQ instruments. Median proportions of imputations, indeterminate data (multiple answers and out of range responses), and logical inconsistencies were very low for all questionnaires. It can further be observed from the results presented in Table 3.4 that some items generated more data problems than others within particular categories. This may be observed from comparison of the Q1 and Q3 values (or more dramatically by comparison of the minimum and maximum values). Previously specified artifactual differences are likely present for three of the data quality categories. For item nonresponse, however, such comparisons are meaningful. The most variable item nonresponse is observed for the staff questionnaires and for the D/TQ instruments. For some staff instruments nonresponse to specific items took the full range from 0 percent for some items to 100 percent for others. From Table 3.4 it is obvious that some questionnaire items had sufficiently questionable quality to exclude them from any analysis.

Table 3.5 indicates data quality of the individual respondent questionnaires. Examining the quartiles, the table indicates reasonably good data with the exception of the staff questionnaires for which over half the questionnaires returned were 17 percent or more incomplete. There was individual variation in the quality of returned questionnaires, as would be expected. This can be observed in Table 3.5 by comparison of Q3 and Q1 (or maxima and minima) for a particular questionnaire and data quality category. Some individuals exhibited considerable difficulty with skip patterns (see maximum value), especially with the D/TQ and FSQ instruments (both of which contained an extremely complex routing pattern). For each questionnaire there were individuals who failed to respond to a large proportion of the items.

In summary, the picture of data quality presented in Tables 3.4 and 3.5 is not such as to present serious problems for analysis. The proportion of individuals with large amounts of questionable data is reasonably small and the greatest problems of data quality seem to lie in a few specific items. Omitting such items restricts analysis to those items for which data quality is within reasonable limits.[18/]

D. Quality of Data (Other Instruments)

Data from sources other than questionnaires (PRV, SARF, STF, and HSCR) were theoretically available on all students (except in the case of school or project refusals), and plans called for considerable use of such information, particularly where respondent-supplied information was missing. In actuality, some items of information were not available for all students. Unavailability, due to difficulties in record keeping at some UB projects or limited access to high school records (some high schools refused to divulge any student transcript information), led to gaps in STF information. Procedures to expedite return of PRV forms, in order to allow timely

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[18/] In subsequent chapters, analyses which are restricted due to data quality of particular items will be specified.

sampling of students, led to incomplete PRV information from some projects. Similar procedures to expedite return of HSCR forms, coupled with inability or refusal on the part of high school teachers to provide all requested information, led to incomplete data for that form. Finally, individual differences in the conscientiousness of the Survey Administrators in documenting the SARF led to differentially informative SARF information.

The use of data items from these other instruments did, however, serve to augment the student-supplied questionnaire responses in analyses. Complete data availability for all students, even with the information from these other forms, was neither expected nor realized. These other forms did provide, besides the additional information, a natural vehicle for reliability studies which are considered in sections IV and V below.

IV. REDUCTION OF STUDENT DATA FOR ANALYSIS AND FURTHER LOSS OF STUDENT DATA

As specified previously, only a subset of data elements were available for the entire student group due to the nature of data collection operations. This section presents a brief summary of the operations performed and discrepancies encountered in reducing questionnaire data to this common set of data elements.[19/] After resolution of the common data elements, the resultant data were examined for possible misclassification of students in respect to the defined sampling frame.

A. Creation of Student Master File and Inter-Instrument Inconsistencies

The file containing the common variables for all students was designated as the student Master File. This file contained 22 measures on each student, obtained from several sources of student data. The elements of the file were: (1) sex; (2) race; (3) age; (4) poverty status index; (5) extent of UB participation; (6) academic risk index; (7) through (9) high

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[19/] For a more detailed account of this procedure, see Appendix E.

school (HS) enrollment status at each of three points in time, fall 1973, spring 1974, and fall 1974; (10) through (12) HS grade level at the same three points in time; (13) through (15) highest grade completed at the same three points in time; (16) through (18) postsecondary education (PSE) status at the same three points in time; (19) through (20) HS equivalency program (HEP) status at each of two points in time, spring 1974 and fall 1974; and (21) through (22) work status in spring 1974 and fall 1974.

The file was created by abstracting the appropriate information from each of the individual student questionnaire files and then obtaining the particular Master File data item from the "most valid"[20/] source available. The large number of student instruments was valuable in many cases, in that data missing from questionnaire responses could be supplemented from other instruments. On the other hand, the presence of replicate information created the possibility of inter-instrument (inter-source) disagreement and thus an inconsistency of the data element. Specific attention is directed to these discrepancies in Section V below; however, due to the importance of the Master File in subsequent analyses of student outcomes, the overall quality of these data is presented here. The specific data problems present in the Master File, after extensive editing and imputation, are given in Table 3.6. Discounting the fact that data were not available during fall 1974 for those not selected for telephone follow-up and the artifactually inflated values noted in Table 3.6, the quality of the Master File data is well within acceptable limits.

B. Further Loss of Student Data

On examining the edited Master File, certain responses were uncovered which indicated inappropriate classification of students within the original sampling frame (some misclassification cases had already been determined at the time of BSQ administration--see subsection III.A of this

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[20/] Source of information could have been student, UB staff member, HS staff member, parent, spouse, friend, etc.; and information could have been obtained by group questionnaire administration, mail, or telephone. These factors were considered in determining "most valid" source--see Appendix E for specifications.

Table 3.6

EXTENT OF UNAVAILABLE AND INCONSISTENT DATA IN STUDENT MASTER FILE

Master File Variable	Data Quality Classification[a]		
	No Data Available	Only Inconsistent Data Available[b]	Available Data with Inter-Instrument Inconsistencies[c]
Sex	0.7%	0.0%	0.0%
Race	2.3	0.0	0.8
Age	2.7	0.0	0.1
Poverty Status	9.7	0.0	0.1
Extent of UB Participation	5.2	0.0	3.7
Academic Risk Status	1.1	0.0	0.1
H. S. Enrollment (Fall 73)	0.0	0.6	0.1
H. S. Enrollment (Spring 74)	1.0	0.1	0.6
H. S. Enrollment (Fall 74)	25.2[d]	0.7	0.1
H. S. Grade Level (Fall 73)[e]	0.2	1.5	0.7
H. S. Grade Level (Spring 74)[e]	5.7	1.3	0.7
H. S. Grade Level (Fall 74)[e]	60.7[d]	0.0	0.0
Highest Grade Completed (Fall 73)	0.1	1.1	0.7
Highest Grade Completed (Spring 74)	0.3	1.2	0.3
Highest Grade Completed (Fall 74)	22.0[d]	2.1	0.1
PSE Status (Fall 73)	2.9	0.0	0.0
PSE Status (Spring 74)	1.0	0.1	0.0
PSE Status (Fall 74)	21.1[d]	0.1	0.0
HEP Status (Spring 74)	4.0	0.2	0.1
HEP Status (Fall 74)	28.6[d]	0.2	0.1
Work Status (Spring 74)	78.4[f]	0.1	0.1
Work Status (Fall 74)	26.4[d]	0.0	0.0

[a] Percentages given are based on 6,050 students after editing and imputation.

[b] Data were available from one or more sources, but all these available data had been previously determined as inconsistent within the particular source instruments.

[c] Data were available from more than one source, and while the data were consistent within instruments (sources) they were inconsistent among instruments.

[d] Missing data percentages for the fall 1974 time point are high due to the fact that subsampling for follow-up fall 1974 data collection activities excluded about one-fifth of the sample.

[e] Missing data percentages are inflated due to the fact that H. S. grade level was indeterminate for students no longer in high school.

[f] The missing data percentage at this time point is inflated due the fact that questions related to work were not posed on the BSQ. Thus, for BSQ respondents (a large portion of the total group), no data are available relating to this variable at this time point.

chapter). There were three categories of misclassification noted: (1) those students classified as UB participants who stated nonmembership (or nonparticipation) in UB at the time point defined by the sampling frame (fall 1973); (2) those students classified as in the CS group in fall 1973 who subsequently reported UB participation; and (3) those students (both UB and CS) who reported they were either out of high school (graduated or otherwise) or at inappropriate grade levels (grade 9 or less) in fall 1973, as required by the sampling frame.

There were many members of the UB group who reported dates of first and/or last participation in UB that conflicted with their classification as being in the project during September or October 1973 (the time point specified for the sampling frame). Allowing a response error of two months as "within reason," 229 such conflicts still remain. Specifically, 36 students reported first participating in UB during or after January 1974, 160 students reported last participation in UB during or before June 1973, and 33 students stated they were not in any UB project during fall 1973--yet all of these students had been specified by project staff (either implicitly or explicitly) as project members during September or October of 1973. A total of 173 students in the CS group stated that they had participated in UB. This type of misclassification had been expected considering (1) that the CS student group was selected from high schools in which UB recruited, and (2) that oversampling of poverty level students who were academic risks was performed. These students were identified through their response to a question regarding UB participation on the BSQ(A) or on the FSQ which were designed to discover this form of misclassification. Finally, 36 students were identified to be in a grade level less than ten during the fall of 1975, and four students not in school at all during this period. For analysis purposes, these students were not considered and the total student sample size was reduced to a total of 5,608.

V. DATA RELIABILITY

Previous examination of item quality within each individual questionnaire (Section III) and within the Master File (Section IV) may serve as an indication of the internal consistency of responses and reliability of the data; however, due to the number of various instruments, studies of the reliability of certain key items were possible. Specifically examined was the consistency of student questionnaire data when compared to data collected from a source other than the student.[21/] Tables 3.7 and 3.8 provide reliability information in the form of proportion of agreement between student reports and project or school reports.[22/]

While proportion of agreement between two sources of data is a relatively crude index of reliability which does not take into account baseline response rates for the various categories of response, it is considered to be useful for the categorical data considered here. Only cases with determinate data (not previously found to be inconsistent or otherwise indeterminate) for both data sources were used in determining percent agreements. The percent agreements between UB student responses to questionnaire items and the responses of project personnel (or data of record collected from project files), as reported on other instruments, are given in Table 3.7 for selected variables common to both instruments. Analogous percent agreements between CS student responses and high school staff responses (or data of record from high school files) are given in Table 3.8. Also reported in Tables 3.7 and 3.8 are maximum numbers of students on which a given reliability index could have been computed (i.e., numbers of students eligible for completion of the various student questionnaires) and the number of cases on which the reported reliabilility index was actually based (i.e., numbers of students with determinate data available from both sources). The difference in these two numbers gives the number of students for whom one or both of the data sources were indeterminate.

[21/] These analyses were produced routinely during the preparation of the Master File, described in the previous section.

[22/] For the UB group, information concerning a particular student was supplied directly or indirectly by the project staff as reflected on the PRV, STF, or SARF. For the CS group, this information was provided by the high school staff as reflected on the HSCR, STF, or SARF.

Table 3.7

PERCENT AGREEMENT BETWEEN UB STUDENT REPORTS AND PROJECT STAFF REPORTS FOR SELECTED VARIABLES

Referenced Time Point[a]	Sources of Data		Number of Eligible Student Respondents[b]	Variable Considered			
				High School Enrollment Status[c]		High School Grade Level	
	Student	Project		Percent Agreement	N[d]	Percent Agreement	N[d]
Fall 1973	BSQ(B)	PRV	3337	99.0%	2672	76.0%	2612
	D/TQ(C)	PRV	573	100.0%	255	80.2%	253
	D/TQ(B)	PRV	373	99.2%	118	79.5%	112
	FSQ(UBB)	PRV	531	94.2%	496	80.3%	467
Spring 1974	BSQ(B)	STF(B)	3337	94.8%	2632	91.4%	2454
	D/TQ(C)	STF(B)	573	92.7%	220	91.9%	203
	D/TQ(B)	STF(B)	373	73.0%	63	76.1%	46
	FSQ(UBB)	STF(B)	531	81.1%	403	83.8%	302

NOTE: Reported percentages are based on unweighted data and computed only on cases for which data from both sources were determinate.

[a] Referenced Time Point refers to the referent point of the item requesting information and not to the point in time at which data were collected.

[b] Total number of students eligible for completion of the specified student instrument.

[c] Determinate responses were collapsed into four categories: (1) in high school; (2) out of high school (graduated); (3) out of high school (not graduated); and (4) out of high school (indeterminate graduation status).

[d] Number of cases on which percentages were based (i.e., number of cases with determinate responses from both data sources).

Table 3.8

PERCENT AGREEMENT BETWEEN CS STUDENT REPORTS AND HIGH SCHOOL STAFF REPORTS FOR SELECTED VARIABLES

	Sources of Data			Variable Considered			
				High School Enrollment Status[c]		High School Grade Level	
Referenced Time Point[a]	Student	Project	Number of Eligible Student Respondents[b]	Percent Agreement	N[d]	Percent Agreement	N[d]
Fall 1973	BSQ(A)	HSCR	2082	99.9%	1765	78.6%	1736
Spring 1974	BSQ(A)	STF(A)	2082	99.8%	1714	95.7%	1687
	D/TQ(A)	STF(A)	258	42.9%	14	e/	e/
	FSQ(CSB)	STF(A)	502	83.3%	205	88.2%	170

NOTE: Reported percentages are based on unweighted data and computed only on cases for which data from both sources were determinate.

[a] Referenced Time Point refers to the referent point of the item requesting information and not to the point in time at which data were collected.

[b] Total number of students eligible for completion of the specified student instrument.

[c] Determinate responses were collapsed into four categories: (1) in high school; (2) out of high school (graduated); (3) out of high school (not graduated); (4) and out of high school (indeterminate graduation status). The latter category is not inconsistent with categories (2) and (3).

[d] Number of cases on which percentages were based (i.e., number of cases with determinate responses from both data sources).

[e] Number of cases on which this percentage could be based is less than 5, and the results would be too unstable to be meaningful.

The pattern of response agreement as shown in Tables 3.7 and 3.8 is quite similar for both the UB and CS groups. Specifically, agreement as to high school enrollment status is greater for the fall 1973 reference point than for the spring 1974 reference point, while agreement as to high school grade level is greater for the spring 1974 reference point than the fall 1973 reference point. Moreover, agreement for the BSQ eligible groups (and the D/TQ(C) eligibles within the UB group) is, in general, higher than for those not eligible for the BSQ (D/TQ(A or B) eligibles) or for those students who responded to none of the spring 1974 instruments or followups.

No attempt will be made to explain the observed patterns of response agreement due to the fact that for some instruments the number of cases on which the proportions are based is small in both an absolute sense and/or relative to the number of eligibles. It should be pointed out, however, that the reliability indices could be artifactual in some respects: namely, (a) data were collected at different points in time and in some cases were retrospective, (b) the base response for fall 1973 high school enrollment status was extremely high for the category "in high school" (for the CS group this was 100 percent by definition), and (c) high school grade level was indeterminate for students classified as out of high school so that disagreement as to enrollment status precluded comparison of grade level (since at least one of the data source variables would then be indeterminate).

In all, the actual rates of agreement are not too discouraging. Considering those comparisons for which a substantial proportion of eligible student data could be used in determining source consistency, proportion of agreement rarely drops below .8. But even an agreement rate of better than .9 would cast some doubt on the reliability of the data when one considers that the variables being compared here are reports of relatively concrete simple states of nature. This would suggest that reliability of more subjective data would be considerably lower.

Given an empirical lack of perfect agreement, the reasons for this lack of agreement between students, on the one hand, and projects and schools, on the other, is a matter of speculation. Possible explanations could range from data entry (coding and keypunch) error to deliberate falsification of responses. Regardless of the reason, the inconsistencies observed should be sufficient to warn the reader of possible errors in subsequent analyses. Although data with observed inconsistencies were not used in subsequent analyses, not all analysis variables could be compared across sources due to lack of commonality in the various instruments. For those variables not amenable to inconsistency checks, there is no reason to suspect that reliability would be greater than that reported here.

Some insight may also be gained into the reliability and validity of the data collected in respect to UB staff questionnaires. During some site visitations, staff responses to certain questionnaire items were examined in face-to-face interviews with the responding staff members. While no statistical evidence is presented, it was reported in many instances that questionnaire responses did not agree with reality. Particularly suspect were the responses to fiscal questions which formed part of the data base for the cost analysis (see Chapter 5).

VI. DIFFERENCES BETWEEN RESPONDENT SUBGROUPS

As specified in Chapter 2, student subgroups, defined by response to different instruments, provide a large number of data sets, the elements of which differ, sometimes markedly. Further, as indicated in Section I of this chapter, certain analysis questions can be addressed only by an examination of one of these exclusive data sets (e.g., many of the analysis questions are directed to data obtained exclusively from respondents to the BSQ). Analyses were therefore conducted to provide the reader with some insight into possible bias in subsequent subgroup analyses. Such biases could be brought about by the high likelihood that subgroups, defined by completion of particular student questionnaires, are not representative of the entire UB or CS population.

This section presents the results of the analyses of respondent subgroup differences. This set of analyses was conducted using a subset of the Master File variables (described in Section IV of this chapter) and using sampling weights. That is, each student's responses were weighted by the inverse of the probability of selecting that student. Such a procedure produces unbiased estimates[23] of subpopulation values when sampling units have unequal probabilities of selection. Also, for this set of analyses, standard errors[24] were computed and are presented.

A. Comparison of Respondents and Nonrespondents in the BSQ Eligible Subgroup

The first difference examined is that between UB students responding to the various administrations of the BSQ, and those who were eligible for BSQ administration but who only responded to the short followup instrument, the D/TQ(C). Theoretically, the latter group should have been in the BSQ data base, but for various reasons did not participate in any of the initial or makeup administrations of the BSQ. Any differences found between these groups should reflect the direction and magnitude of differences between respondents and nonrespondents in the BSQ eligible group. The result of the comparison is given in Table 3.9. As seen from Table 3.9, there are few statistically significant[25] differences between the two subgroups. The variables yielding significant differences are age and extent of UB participation. Since the percentage of indeterminate response to extent of UB participation is also significantly different, other differences for this variable are difficult to evaluate; however, there is

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[23] The term unbiased is used here in a statistical sense. An unbiased estimate of some population value (parameter) is defined as one obtained from an estimator with expected value equal to the parameter value. Since only a sample from the population is used to estimate the population value, the value of the estimate will vary from one sample to another. If the mean value of the estimates obtainable from all possible samples is the same as the population value being estimated, then the estimate is unbiased.

[24] The standard error of an estimate (or differences between estimates) is a measure of the extent to which the estimate (or difference) would fluctuate between different samples. More precisely, the standard error of an estimate is the estimated standard deviation of the sampling distribution of the estimator used.

[25] Statistical significance is defined here as differences greater than two standard errors of difference. Such differences would occur less than 5 times in 100 by chance sampling error if, in fact, there was no true difference.

Table 3.9

DIFFERENCES BETWEEN BSQ(B) RESPONDENTS AND D/TQ(C) RESPONDENTS ON SELECTED VARIABLES

Variable	Response Category	Percentage[a/] BSQ(B)	Percentage[a/] D/TQ(C)	Standard Error of Difference
Age	Mean Age[b/]	16.8 Yrs.	17.3 Yrs.	0.1 Yrs.
	Indeterminate[c/]	0.3%	1.5%	0.8%
Sex	Male	43.8	40.6	4.2
	Female	56.2	59.4	4.2
	Indeterminate[c/]	0.0	0.0	
Race	Black	64.6	57.1	4.6
	White	16.6	21.0	3.8
	Other	18.0	19.7	4.2
	Indeterminate[c/]	0.8	2.2	1.0
Poverty	Poverty Level	65.8	64.1	3.5
	Non Poverty Level	22.4	22.6	d/
	Indeterminate[c/]	11.8	13.4	1.8
Grade Level Fall 1973	10th Grade	14.6	11.5	2.0
	11th Grade	40.0	37.6	4.2
	12th Grade	44.2	47.3	4.6
	Indeterminate[c/]	1.1	3.6	1.6
Grade Level Spring 1974	10th Grade	12.7	8.3	2.5
	11th Grade	39.8	37.4	3.8
	12th Grade	45.0	48.0	4.7
	Indeterminate[c/]	2.5	6.3	1.6
H.S. Enrollment Spring 1974	In High School	98.2	96.3	1.2
	Graduated from High School	0.3	0.0	d/
	Out of H.S., Not Graduated	0.9	1.4	d/
	Indeterminate[c/]	0.6	2.3	1.0
Extent of Upward Bound Participation	Less than 1 Year	50.0	51.3	3.9
	1-2 Years	27.0	13.2	3.3
	2 or More Years	13.2	5.8	2.0
	Indeterminate[c/]	9.8	29.7	4.0

[a/] Mean age is given in years, all other entries are percentages. All values were computed using weighted data adjusted for instrument nonresponse.

[b/] Based on determinate responses only.

[c/] Indeterminate responses represents item nonresponse, inconsistent and multiple responses.

[d/] Standard errors were not computed for absolute differences less than 1%.

an indication that the BSQ respondent group may be a biased representation of the BSQ eligible group in that they are younger and have participated in UB for a longer period of time.

B. Comparison of the BSQ Eligibles Subgroup and the Subgroup of BSQ Ineligibles

Another possible comparison concerns the difference between BSQ respondents and those students in the original sample who were no longer at the same project or school at the time of BSQ administration (and thus not eligible for BSQ administration). This latter subgroup was the D/TQ (Forms A and B) eligible subgroup. It should be recalled, however, in interpreting the result of this analysis that the actual comparison made was that between the D/TQ (Forms A and B) respondents and BSQ respondents and that response rates for these D/TQ forms were extremely low. Thus, the D/TQ respondents were not necessarily representative of the entire D/TQ eligible group. Further, it has been shown previously that within the UB group the BSQ respondent group was not completely representative of the BSQ eligible group.

Table 3.10 presents the results of these comparisons for both the UB group and the CS group. There are numerous statistically significant differences between the two respondent subgroups within both the CS and UB groups. As expected, the D/TQ respondents differed from the BSQ respondents (for both UB and CS) in terms of high school enrollment status in spring 1974. The D/TQ respondent subgroups showed proportionally greater numbers who had dropped out of school (this finding would still hold even if all indeterminate responses in the BSQ respondent subgroup were assumed to be dropouts and all indeterminate responses in the D/TQ respondent subgroup were assumed to be still in high school). Further, the D/TQ respondent subgroup (both UB and CS) was significantly older than the BSQ respondent subgroup (which could easily be related to the fact that there were greater numbers of high school dropouts).

All other variables showing significant differences between the respondent subgroups within the CS group were attenuated by differing proportions of indeterminate responses. For the UB group, other statistically significant differences between the two respondent subgroups were also observed.

Table 3.10

DIFFERENCES BETWEEN BSQ RESPONDENTS AND D/TQ RESPONDENTS ON SELECTED VARIABLES

Variable	Response Category	Upward Bound			Comparison Students		
		Weighted Percent[a]		Standard Error of Difference	Weighted Percent[a]		Standard Error of Difference
		BSQ(B)	D/TQ(B)		BSQ(A)	D/TQ(A)	
Age	Mean Age[b]	16.8 Yrs.	17.4 Yrs.	0.1 Yrs.	16.4 Yrs.	17.2 Yrs.	0.2 Yrs.
	Indeterminate[c]	0.3%	0.6%	d/	0.1%	0.0%	d/
Sex	Male	43.8	32.1	5.7	54.3	41.9	9.2%
	Female	56.2	67.9	5.7	45.6	58.1	9.2
	Indeterminate[c]	0.0	0.0	d/	0.1	0.0	d/
Race	Black	64.6	52.1	7.6	24.6	31.1	11.0
	White	16.6	18.2	3.6	60.8	44.9	11.2
	Other	18.0	26.6	7.0	12.8	22.8	7.6
	Indeterminate[c]	0.8	3.1	1.7	1.8	1.1	d/
Poverty	Poverty Level	65.8	72.3	5.5	32.9	48.4	9.4
	Non Poverty Level	22.4	23.4	d/	65.4	51.6	9.0
	Indeterminate[c]	11.8	4.4	2.0	1.7	0.0	0.8
H.S. Grade Level Fall 1973	10th Grade	14.6	11.8	4.8	37.0	34.4	10.1
	11th Grade	40.0	30.4	5.5	33.4	36.6	6.7
	12th Grade	44.2	53.4	6.1	28.5	29.0	d/
	Indeterminate[c]	1.1	4.4	2.2	1.1	0.0	0.3
H.S. Grade Level Spring 1974	10th Grade	12.7	8.3	4.0	36.7	24.5	9.2
	11th Grade	39.8	25.7	5.0	33.6	15.0	5.3
	12th Grade	45.0	36.6	5.8	28.5	4.7	2.6
	Indeterminate[c]	2.5	29.4	5.9	1.2	55.8	9.1
H.S. Enrollment Spring 1974	In High School	98.2	70.6	5.9	99.9	44.2	9.1
	Graduated from High School	0.3	2.6	1.5	0.0	7.1	4.6
	Out of H.S., Not Graduated	0.9	17.9	5.4	0.0	44.7	8.9
	Indeterminate[c]	0.6	8.9	2.4	0.1	4.1	2.6
Extent of Upward Bound Participation	None				100.0	100.0	d/
	Less than 1 Year	50.0	53.1	5.0			
	1-2 Years	27.0	12.5	2.8			
	2 or More Years	13.2	0.0	1.8			
	Indeterminate[c]	9.8	34.4	3.6			

[a] Mean age is given in years, all other entries are percentages. All values were computed using weighted data adjusted for instrument nonresponse.

[b] Based on determinate responses only.

[c] Indeterminate responses represents item nonresponse, inconsistent and multiple responses.

[d] Standard errors were not computed for absolute differences less than 1%.

Notably, the BSQ respondent subgroup had a larger proportion of males. Other significant differences are attenuated with differences in proportion of indeterminate responses.

In all, many of the differences observed between BSQ and D/TQ respondent subgroups (within CS and UB groups) could be expected (or related to these expectations) due to the fact that the D/TQ subgroups contained, by definition, more high school dropouts. Nevertheless, the groups do differ on important variables, and it should be realized in subsequent examinations of BSQ data that the students providing these data are not representative of the entire population of UB or CS students defined by the initial sampling. To the extent, however, that these subgroups differences are similar within the UB and CS groups (and this seems to be the case), greater credence can be placed on comparisons between UB and CS BSQ respondent data.

C. Comparison of Respondents and Nonrespondents to All Spring 1974 Questionnaires

Another comparison of interest between respondent subgroups is that between respondents and nonrespondents to spring 1974 data collection efforts. As may be recalled, respondents to the spring 1974 data collection were eligible for the FSQ(A) instruments while nonrespondents received the FSQ(B) instruments. The actual comparison made was between the FSQ(A) eligible group and the FSQ(B) respondents.[26] Since response rates were so high for the FSQ(B) eligible group (recall that all FSQ(B) eligibles were telephoned as a followup), the respondents can be assumed as quite representative of the total eligible group. Moreover, since the BSQ respondent group made up such a large proportion of the spring 1974 respondents, this analysis will reflect, primarily, differences between BSQ respondents and spring 1974 nonrespondents.

The results of this analysis are presented in Table 3.11. As can be seen, these two respondent subgroups (both CS and UB) differ significantly on all eight of the variables considered. For both the UB and CS group, the FSQ(A) eligible subgroup is younger than the FSQ(B) respondent subgroup, although this difference is somewhat attenuated by the fact that the

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[26] For FSQ(B) nonrespondents, no questionnaire data of any kind were obtained.

Table 3.11

DIFFERENCES BETWEEN FSQ(A) ELIGIBLES AND FSQ(B) RESPONDENTS ON SELECTED VARIABLES

Variable	Response Category	Upward Bound			Comparison Students		
		Percentage[a]		Standard Error of Difference	Percentage[a]		Standard Error of Difference
		FSQ(A) Eligibles[b]	FSQ(B)		FSQ(A) Eligibles[b]	FSQ(B)	
Age	Mean[c]	16.9 Yrs.	17.8 Yrs.	0.1 Yrs.	16.5 Yrs.	17.3 Yrs.	0.1 Yrs.
	Indeterminate[d]	0.4%	3.1%	1.2%	0.1%	16.4%	3.7%
Sex	Male	43.1	51.3	2.6	54.0	51.5	3.9
	Female	56.9	48.7	2.6	45.8	46.1	[e]
	Indeterminate[d]	0.0	0.0	[e]	0.1	2.4	0.9
Race	Black	63.6	45.1	4.5	24.8	41.6	4.5
	White	17.0	24.0	4.0	60.5	36.1	5.7
	Other	18.5	28.7	2.8	13.0	8.4	3.2
	Indeterminate[d]	1.0	2.1	0.8	1.8	13.9	3.0
Poverty	Poverty Level	65.9	56.4	2.9	33.3	40.3	3.2
	Non Poverty Level	22.5	23.2	[e]	65.0	46.7	5.0
	Indeterminate[d]	11.6	20.4	2.4	1.7	13.0	5.0
H.S. Grade Level Fall 1973	10th Grade	14.3	14.6	[e]	36.9	39.7	4.1
	11th Grade	39.5	26.8	2.5	33.5	25.8	3.1
	12th Grade	44.8	48.5	3.1	28.5	31.8	4.5
	Indeterminate[d]	1.4	10.1	1.4	1.1	2.8	0.9
H.S. Grade Level Spring 1974	10th Grade	12.2	13.2	[e]	36.4	29.4	4.2
	11th Grade	39.1	23.1	2.4	33.2	16.9	2.7
	12th Grade	44.9	43.0	2.9	28.0	27.1	[e]
	Indeterminate[d]	3.8	20.7	2.2	2.5	26.6	3.2
H.S. Enrollment Spring 1974	In High School	97.0	83.3	2.1	98.6	74.9	3.3
	Graduated from High School	0.3	1.8	0.8	0.2	1.9	0.8
	Out of H.S., Not Graduated	1.6	11.5	1.7	1.0	19.9	3.1
	Indeterminate[d]	1.0	3.3	1.0	0.2	3.3	0.9
Extent of Upward Bound Participation	None				100.0	100.0	[e]
	Less than 1 Year	50.2	66.6	2.9			
	1-2 Years	25.4	17.2	2.6			
	2 or More Years	12.1	7.0	1.7			
	Indeterminate[d]	12.3	9.1	1.5			

[a] Mean age is given in years, all other entries are percentages. All values were computed using weighted data adjusted for instrument nonresponse.

[b] FSQ(A) eligibles were those students who had previously responded to either BSQ or D/TQ instruments.

[c] Based on determinate responses only.

[d] Indeterminate responses represents item nonresponse, inconsistent and multiple responses.

[e] Standard errors were not computed for absolute differences less than 1%.

proportion of indeterminate responses is greater in the FSQ(B) subgroup. Further, there are proportionately more eleventh graders (both in fall 1973 and spring 1974 classifications) in the FSQ(A) subgroup. Again, however, these differences are confounded by differences in proportions of determinate responses. The FSQ(A) subgroups also have proportionately fewer high school dropouts, and although differences exist in proportion of indeterminate responses, the observed differences would exist regardless of distribution of the indeterminate responses among the other enrollment status categories.

For the UB group, respondents to the spring 1974 data collection efforts tend to have proportionately larger numbers of females than nonrespondents. Further, in terms of extent of UB participation, the FSQ(A) subgroup (spring 1974 respondents) has participated longer in the UB program.

Two interesting reversals appear in subgroup differences within the UB and CS group in regards to the variables of race and poverty status. Within UB, the FSQ(A) eligible group had proportionately fewer white students and more black and "other" students than did FSQ(B) respondents. The opposite situation existed for the CS group. Similarly, the FSQ(A) subgroup had proportionately larger numbers of poverty level students within the UB group, but proportionately fewer poverty level students within the CS group. This reversal has some rather obvious implications for subsequent analyses. Specifically, when comparing responses of the UB and CS groups based exclusively on spring 1974 questionnaire data (e.g., BSQ), one is comparing two subgroups of the sampled populations that are (1) not representative of the total sample, and (2) biased in opposite directions for at least two variables considered.

D. Comparison of Respondents and Nonrespondents to the FSQ

The final consideration of compariability of respondent subgroups is that of possible differences between FSQ(A) respondents and FSQ(A) nonrespondents. It may be recalled that only a subsample of the original nonrespondents to the FSQ(A) mailing were selected for telephone followup. As such, considerably less than complete response was obtained for the fall 1974 data collection period. It is possible (since data was collected on all FSQ(A) eligibles during the spring 1974 collection period) to determine the extent to which the respondent subgroup was or was not representative of the total group.

Table 3.12 presents the results of this final comparison. For the CS group only two statistically significant differences were observed, notably, the respondent subgroup was composed of greater proportions of females and white students. For the UB group, the picture was somewhat different. There were proportionately greater numbers of eleventh graders among the FSQ(A) respondent subgroup than among the nonrespondents, and respondents had typically participated in the UB program for a shorter period of time. Like the CS group, the UB group had proportionately more females in the respondent subgroup. The UB respondent subgroup also contained proportionately larger numbers of poverty level students, and (with marginal significance) larger proportions of white students and younger students.

These observed differences suggest, of course, that fall 1974 data are available for a subset of students (in both UB and CS groups) that is not completely representative of the original sample. This fact should be kept in mind when interpreting results based on fall 1974 data.

E. Implications of Subgroup Differences

In general, Tables 3.9 through 3.12 indicate the possibility of some biases in the analyses. Differences do exist, and resulting analyses and interpretation of student data must be conducted carefully with the possibility of this bias in mind. The effects of balancing and weight adjustments for nonresponse and subsampling (see Chapter 7) reduce differences between UB and CS groups, but do not completely discount differences between UB respondents to different UB questionnaires or CS respondents to different CS instruments.

The differences examined in this section will be important considerations only when data from the specified exclusive subgroups are analyzed, and then the major consideration will be that of generalizability of the analysis results. The exact nature of analysis bias can not be stated directly; rather, it will depend on the interrelationships of the variables on which subgroups show differences and other variables subsequently considered in analyses based on that subgroup. For example, it has been suggested

Table 3.12

DIFFERENCES BETWEEN FSQ(A) RESPONDENTS AND FSQ(A) NONRESPONDENTS ON SELECTED VARIABLES

		Upward Bound			Comparison Students		
		Percentage[a]		Standard Error of Difference	Percentage[a]		Standard Error of Difference
Variable	Response Category	FSQ(A) Respondents	FSQ(A) Nonrespondents		FSQ(A) Respondents	FSQ(A) Nonrespondents	
Age	Mean[b]	16.9 Yrs.	17.1 Yrs.	0.1 Yrs.	16.4 Yrs.	16.6 Yrs.	0.1 Yrs.
	Indeterminate[c]	0.5%	0.3%	d/	0.0%	0.4%	d/
Sex	Male	41.6	48.1	2.1%	51.6	62.1	3.2%
	Female	58.4	51.9	2.1	48.4	37.5	3.1
	Indeterminate[c]	0.0	0.0	d/	0.1	0.4	d/
Race	Black	63.0	65.7	2.6	23.1	30.3	4.4
	White	17.8	14.1	1.6	63.7	49.6	4.3
	Other	18.4	18.9	d/	11.6	17.6	2.9
	Indeterminate[c]	0.8	1.3	d/	1.6	2.5	d/
Poverty	Poverty Level	67.2	61.8	1.7	32.2	36.8	3.4
	Non Poverty Level	21.6	25.2	2.1	66.5	60.1	4.3
	Indeterminate[c]	11.2	13.0	1.4	1.3	3.1	2.0
H.S. Grade Level Fall 1973	10th Grade	14.8	12.5	1.8	37.4	35.4	3.9
	11th Grade	42.4	30.2	2.2	34.1	31.3	2.8
	12th Grade	41.5	55.5	2.8	27.3	32.7	3.4
	Indeterminate[c]	1.3	1.8	d/	1.2	0.6	d/
H.S. Grade Level Spring 1974	10th Grade	12.7	10.6	1.7	37.2	33.8	3.8
	11th Grade	42.4	28.2	2.4	33.8	31.1	2.7
	12th Grade	41.3	56.4	3.2	26.8	32.0	3.4
	Indeterminate[c]	3.5	4.8	0.7	2.3	3.1	d/
H.S. Enrollment Spring 1974	In High School	97.3	96.2	0.7	99.0	97.5	0.9
	Graduated from High School	0.3	0.5	d/	0.2	0.2	d/
	Out of H.S., Not Graduated	1.7	1.6	d/	0.8	1.9	0.7
	Indeterminate[c]	0.8	1.7	d/	0.2	0.4	d/
Extent of Upward Bound Participation	None				100.0	100.0	d/
	Less than 1 Year	54.2	37.1	2.8			
	1-2 Years	24.4	28.8	2.6			
	2 or More Years	10.8	16.6	1.8			
	Indeterminate[c]	10.7	17.5	2.0			

[a] Mean age is given in years, all other entries are percentages. All values were computed using weighted data adjusted for instrument nonresponse.

[b] Based on determinate responses only.

[c] Indeterminate responses represents item nonresponse, inconsistent and multiple responses.

[d] Standard errors were not computed for absolute differences less than 1%.

that the BSQ respondent subgroup tends to be younger than the BSQ eligible nonrespondents and that the BSQ eligible subgroup is younger than those not eligible for BSQ administration. This result may or may not affect interpretation of subsequent analyses. If one were considering only the subset of BSQ respondents on some variable which is unrelated to age (such as place of residence), then the fact that BSQ respondents were younger than nonrespondents and ineligibles should not, in itself, restrict generalizations of results to the entire eligible groups or to the total populations. On the other hand, if a variable strongly related to age were being considered, any generalizations to larger populations would not be warranted without first considering the fact that BSQ respondents were younger.

For analyses involving comparisons of the UB and CS groups, the differences considered in this section are relatively less important. For the large majority of differences examined, the extent and direction of subgroup differences was similar within the UB and CS groups. If bias within the two groups are the same, then differences between these two groups will not reflect the bias (which is cancelled in the subtraction).

VII. SUMMARY

In this chapter the basic approach to analysis has been presented and the quality of the data to be used in analyses has been examined. The purposes of this presentation were: (a) to provide the reader with the overall framework within which analysis was conducted; (b) to advise the reader as to the scope of questions addressed in subsequent chapters; and (c) to forewarn the reader of possible misinterpretations of results which could occur due to the less than perfect quality of the data analyzed.

A reiteration of the purposes, procedures, and scope of analysis is not considered instructive; however, a review of the findings of the analyses reported in this chapter is worthwhile. The findings regarding data quality and possible implications for analysis are summarized below.

A. Return Rates

The return rate for various instruments have two obvious implications for analysis, both of which concern how well the data collected represents the data which would have been available with complete return. If respondents are like nonrespondents in all relevant characteristics (an assumption that is commonly made but rarely justified), then response rates present no problem for analysis. It was shown, however, that respondents differ from nonrespondents and thus that the data in hand do not likely reflect the true picture that would have been obtained had all data been collected. The greater the return rate, of course, the less the nonrespondent group can influence the results obtained, regardless of how different they might be from respondents.

The results relevant to return rates reported in this chapter address both of the possible sources of nonrepresentativeness of collected data: (1) individual response rate, and (2) the clustering of nonrespondents (i.e., the distribution of nonresponse over logical units of possible respondents--in this case UB projects). With the exception of return rates for the D/TQ, most student instruments showed satisfactory return rates (75 percent or greater) and showed no serious response differential over projects. More importantly for analyses involving differences between the UB and CS groups, return rates were similar for these two groups. With the fairly safe assumption that any data bias, introduced as a result of nonresponse, is similar for UB and CS groups, comparisons of the two groups should not reflect a bias due to nonresponse.

Overall student response rate (return of one or more of the questionnaires) was quite high, 99.8 percent for the UB group and 98.3 percent for the CS group, reflecting efforts in the fall 1974 data collection to reach all previous nonrespondents. Followup subsampling of students who had returned questionnaires during the spring 1974 data collection period raised the fall 1974 data return rates to 80.2 percent and 78.1 percent for the UB and CS groups, respectively.

Return rates and differential project response was less satisfactory for the staff instruments, particularly in light of the importance of the study to those staffing the projects. Nevertheless, project staff questionnaire response was within acceptable levels.

B. Data Quality

High and nondifferential return rates do not in themselves assure data integrity. Item nonresponse, careless response, and deliberately misleading responses can greatly degrade the data even if 100 percent return of questionnaires is realized. Further, some error is to be expected in large computerized data bases due to human mistakes made in transcribing hard copy into machine readable form. Regardless of the source of errors of omission or comission, some items in the ultimate data base may be unusable due to: (1) missing data, the absence of a response where one is called for; (2) out of range data, responses that are not within the prescribed (or reasonable) range of responses; (3) multiple responses, the presence of more than one response to an item stipulating only one response; and (4) inconsistent data, responses that are logically conflicting. The latter broad category includes skip pattern inconsistencies, inconsistencies within instrument, and inconsistencies between instruments.

In attempts to rectify some of the problems of data quality, techniques of imputation are often employed. The use of imputations is effectively that of creating data where there were unusable data previously. Most imputation techniques have potential for introducing some erroneous data; however, the gain realized through sound techniques of imputation generally offsets the loss due to introduction of some error.

The implication of the various forms of potential data error for analysis are quite obvious. Large proportions of unavailable or unusable data can easily create a situation where available data are not representative of the entire respondent group, particularly if certain relevant respondent characteristics are related to the unavailability of the data. Inconsistent data and error introduced through imputation may lead to fallacious results and misinterpretation of findings.

Examinations of indeterminate data suggested that the incidence of multiple and out of range responses was quite low, accounting for no more than 0.2 percent of the data on the average, for any given questionnaire item. The relative frequency of imputed responses was, on the average, even lower. The incidence of item nonresponse was considerably greater; however, this data problem seemed to be concentrated within a few items and individuals. In terms of the Master File variables, proportions of unavailable data were, in general, quite low; however, the proportion was greater than 20 percent for all of the variables related to the fall 1974 time point. These high percentages reflected the high nonreturn rate for these instruments due to subsampling for followup data collection. In all, the extent of unavailable data had no serious impact on analysis.

Examinations of item inconsistency did raise some serious questions regarding data quality. Major inconsistency problems arose for the items that were nested within various questionnaire routing items. Considering the complexity of some of the skip patterns, these inconsistencies are not surprising in retrospect. In view of the problems introduced by the skip patterns, however, data from items contained in routing items were used sparingly in analysis.

The extent of logical inconsistent responses within specific questionnaires was, in some cases, considerably greater than would be desired. Two items of the PDQ were answered inconsistently by more than 20 percent of the project directors. Proportionately large numbers of inconsistent responses were, however, traced to items which appeared on reexamination to be somewhat ambigious. Nonetheless, incidence of inconsistency still remained at upwards of 5 percent for some relatively unambigious items.

The observed inconsistency of responses between instruments is also a matter of concern. Since such inconsistencies typically reflect response differences between two different reporting sources, they pose questions as to the credibility of one of the sources. The incidence of such inconsistencies was high in light of the relatively objective nature of the responses compared. Discounting comparisons in which fewer than 250 cases were involved, inconsistent response rates were almost as high as 25 percent for some comparisons. Although inconsistent data were not used in analysis, it is possible that the remaining students with nondiscrepant responses were not representative of the entire group and that analyses were somewhat biased as a result. The overall picture of intersource inconsistencies is somewhat brighter considering the total student group on the entire set of Master File variables. The maximum percentage of inconsistent data for the total group of 6,050 students on the 22 Master File variables was less than 4 percent.

The danger of high rates of observed inconsistency is not in the items for which that inconsistency is observed, since any response observed to be inconsistent with another response was not used in analysis. The real problem exposed by the observance of inconsistencies in the data lies with those items which were not amenable to consistency checks. An observed high rate of inconsistency is symptomatic of one or more of several factors which could be influencing some or all of the remaining data items (e.g., ambiguity of question wording, inattention or carelessness on the part of the respondent, or deliberate attempts to provide false data on the part of the respondent). The consistency checks performed signal the strong possibility of one or more of these factors in the responses of some individuals on some items, which reduces the reliability, and thus the validity, of the data.

C. Representativeness of Respondent Subgroups

The potential problems of nonrepresentativeness of certain data has been previously discussed as it relates to questionnaire return rates and data quality. Another potential source of nonrepresentativeness is possible within the current study; specifically, the fact that the same information items were not requested from all student subgroups. The most extensive set of student data is potentially available from the subset of students who were administered the BSQ. Other subgroups of students (e.g., the D/TQ eligibles and the FSQ (Form B) eligibles) could not provide the richness of data present for BSQ respondents, due to the limits of the questionnaires administered to them. Analysis of BSQ data is, of course, possible, but the extent to which the results can be generalized to the total student group (and to the population from which these groups were drawn) depends upon the extent to which the BSQ respondents are representative of the total group. By using the variables common to all instruments for comparison, it was possible to conduct an investigation to determine empirically the extent and direction of lack of representativeness among certain subgroups of students.

Statistically significant differences were detected for almost all of the subgroup comparisons made. Some of these differences were logically related to subgroup definitions, and thus unavoidable (e.g., the fact that there was a greater incidence of high school dropout for the D/TQ respondents than for the BSQ respondents was not surprising in light of the fact that BSQ eligibles were defined as those at the same school or project at time of questionnaire administration and the D/TQ eligible subgroup was defined as the complement of the BSQ subgroup). While the direct implications for analysis interpretation due to subgroup differences cannot be directly stated, the results indicate that there is a strong possibility of bias in results obtained for specific questionnaire respondent subgroups.

In Chapter 6, for example, an examination is made of perceptions of the UB program by UB participants. These results were obtained for BSQ respondents exclusively and as such they represent a source of possible bias in that they may not reflect the perceptions of all UB participants. The reasons for the potential bias is that BSQ respondents are, in general, younger than other BSQ nonrespondents or BSQ ineligibles; and the respondents have, typically, been with the UB program for a longer period of time than either of the other two subgroups. This would suggest, intuitively, that the results presented in Chapter 6 are more favorable to the program than results which would have been obtained had this information been available for all members of the UB sample.

Fortunately, for the large majority of differences examined, the difference between subgroups of respondents within the UB group was quite similar in form to the difference within the CS group. This suggests, but does not guarantee, that whatever biases are introduced in UB group results, they are of the same nature (and presumably of the same magnitude) as those introduced in the CS group. If this is the case, then comparisons between the CS and UB groups should be relatively free of bias, even when such comparisons are being made within a particular respondent subgroup (such as BSQ respondents).

Chapter 4

Characteristics of the Upward Bound Staff

I. GENERAL

This chapter and the two chapters which follow provide a description of various aspects of the national UB Program in program year 1973-74, based on the data gathered in staff and student questionnaires. To provide national profiles, the results are presented as national estimates of the characteristics of the UB staff, students, and projects across the population of 333 regular UB projects[1] operating in coterminous United States in program year 1973-74.

The primary purpose of this chapter is to provide a national descriptive profile of the staff members serving the UB projects. More specifically, answers to the following questions are pursued: (a) what were the demographic and background characteristics of UB project staff members? (Section II); (b) what educational background, training, and work experience did UB project staff members have? (Section III); (c) what tasks did UB project staff members perform and how did they divide their time in fulfilling their respective positions? (Section IV); (d) what attitudes did UB project staff members hold on issues having impact on educational intervention programs? (Section V).

Tabular data are presented within each of three staff categories: project directors, project instructors, and project counselors. The total weighted numbers (WN) of respondents reported in the tables in this chapter are national estimates of the number of staff in each staff category for the UB projects at the time of the study. The questionnaire data obtained from 48 of 54 sampled project directors are used to describe the estimated

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[1] This excludes special veteran projects and demonstration projects.

333 directors in the nation. Similarly, the profile of an estimated national total of 2,973 project instructors is derived from questionnaires returned by 154 of 211 sampled project instructors. Finally, representing the national estimate of 1,184 UB project counselors are the 84 of 104 sampled project counselors who returned questionnaires. Because of unequal weighting and the relatively small number of cases (only two projects per strata) caution should be taken in interpreting results of estimates based on items with a large amount of nonresponse because, in general, the nonresponding cases will not be distributed evenly (or proportionally) over the valid response categories. For this reason, the numbers of nonrespondents to an item are included in the tables. Because of rounding error, the total sum of proportions in tabular presentations will vary around 100 percent; also the sum of weighted numbers will vary around 326[2/] for the project directors, around 2,973 for the project instructors, and around 1,184 for the project counselors.

Although questionnaire responses are the primary data for this and following chapters, some findings and perceptions from the visits to 15 project sites will be used to augment and aid in interpretation of the primary data. Some topical areas were not covered or were covered only tangentially in the questionnaires (e.g., nature and functions of advisory groups, evidence of institutional commitment, adherence to federal guidelines), and questions concerning these topics can be addressed only by the information gained during site visitation. For other topics, which can be addressed by questionnaire data, clarification, confirmation, or contradiction may be gained by insights from the considerably richer observation base of site visits.

While the benefits of using information collected during site visits are obvious, it should be kept in mind that hard data were not gathered on

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[2/] The sum of the sampling weights for project directors, which estimates the number of project directors (and also the number of projects) in coterminous United States, is 326. This figure differs from the known actual number of projects, which is 333. Since the sampling weight for a project is the inverse of the probability of selection of that project, the sum of these weights will vary depending on the particular sample of projects which is drawn. The expected value of this sum, over all possible samples, will be 333, but for any particular sample may not total exactly to 333.

program operations or other features of UB projects, since the essential effort was to "discover what was there" and considerable variability was anticipated. In this respect, it was not possible to approach each visit in the same way or to gather the same kinds of information, partly because circumstances varied and partly because of the subjective nature of site visits. Moreover, it was possible to visit only 5 sites during the academic year and 15 summer programs. As a result, reports of site visit data must be viewed as an impressionistic and sometimes inferential look at Upward Bound in action.

Before moving to presentation of results, three topics require consideration: (a) adjustments of sample weights, (b) sampling errors, and (c) other possible sources of data error. These matters are treated briefly in the remainder of this section, but relate to all results to be presented in this and subsequent chapters.

A. Sample Weights and Adjustments for Instrument Nonresponse

In the complex sample design used in the UB survey, units of study (individuals or projects) were selected into the sample with unequal probabilities. Therefore, to inflate the sample to the size of the population being estimated (so that each person or project represented the correct number of persons or projects, respectively, in the population), sample weights that were inversely proportional to the probability of selection were applied to individual answers.[3/] Consequently, in the data tables presented in this and subsequent chapters, individuals or projects do not represent equal numbers of cases in the population.

In producing these national estimates adjustments were made to correct for the failure of some individuals to return questionnaires (instrument nonresponse). In general, adjustments for nonresponse were made by increasing the weight assigned to the responses of those judged to be most similar

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[3/] See Appendix B for a discussion of the use of sample weights. In this chapter, where staff members are the units of analyses, sample weights proportional to the inverse of each person's probability of selection were applied to their responses. In this way, each staff member represents the correct number of staff members of his staff type in the population.

to the nonrespondents. Thus, on the assumption that persons in the same projects shared many relevant characteristics, sample weights for nonrespondents of a particular project were assigned to others in the same project. If there were no appropriate responding persons in the same project, the nonrespondents' sample weights were allocated to appropriate persons in the other project in the same sample stratum since similar projects had been placed together in the strata. The specific adjustment procedures depended on the unit of analysis.[4/]

B. Sampling Error

Whenever a sample is used instead of the entire population, the resulting data are subject to error due to sampling. That is, differences would be expected between the results obtained for a given sample and those that would be obtained for another sample or for the population. The results for the population always remain unknown, but the larger the sample, the smaller is the expected sampling error. Estimates of the magnitude of the expected sampling error can be calculated from sample data, and are termed standard errors of estimates of population values. However, because of the complex nature of the sample design that was used for the selection of UB staff and students, the familiar textbook formulas for standard errors are not applicable.

To provide estimates of standard errors for the large number of estimated percents that are reported in this and subsequent chapters, and to provide them at a reasonable cost, estimated standard errors were computed only for selected items. The results were then used to create generalized tables of standard errors that provide a general order of magnitude of the standard errors for the estimated percents. Each of Chapters 4, 5, and 6 presents a generalized table that is applicable to that chapter.

The magnitude of the standard error for an estimated percentage is determined by a number of factors, including: (1) the number of projects

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[4/] See Appendix F for a detailed discussion of adjustments for nonresponse. In this chapter adjustments for instrument nonresponse were made within staff categories (e.g., sample weights of nonresponding counselors were allocated to responding counselors in the same project, or if there were none, to responding counselors of the other project in the stratum).

and the number of clients or staff members selected into the sample, (2) the magnitude of the estimated percent, and (3) the way in which the characteristic being estimated is distributed among projects. The formulas and procedures that were used in calculating the standard errors are presented in Appendix B, and Table 4.1 gives the generalized standard errors for this chapter.

The method for using Table 4.1 is included in the table, but will be demonstrated here in the following example. From Table 4.2 (Page 4.8), it can be seen that the estimated percent of instructors who were 36 to 45 years of age was 17.2. To determine the approximate standard error of this estimated percent, column F of Table 4.1 would be used, because the estimated 17.2 percent relates to instructors and is based on a sample size of 154 (total "N"). By entering the row labeled "15 or 85" percent which contains the closest values to 17.2, the standard error of 3.1 percentage points is found. This value is the approximate standard error of the estimated 17.2 percent which can be used to construct confidence intervals for the estimate.[5/] If one were to construct a 95 percent confidence interval, one would be 95 percent sure that the true population value (percent of 36- to 45-year-old UB instructors in the population) is between 10.8 and 23.4 (i.e., 17 - 2(3.1) and 17 + 2(3.1)). The reader is encouraged to refer to the standard errors shown in Table 4.1 when interpreting the percents presented in the data tables of this chapter to establish some guidelines as to the level of precision of the estimates presented.[6/]

[5/] The confidence interval is a range of values within which one expects the true population value to be. If the same sampling and estimation procedure were repeated indefinitely, and for each sample an interval was constructed that was two standard errors on either side of the estimated percent, one would find that about 95 percent of these intervals would contain the true population value. An interval so constructed is called the 95 percent confidence interval. A 99 percent confidence interval is formed by taking two and one-half standard errors on either side of the estimated percent.

[6/] In some of the data tables in this chapter, means as well as percents are tabulated. The specific standard errors of these means are displayed in the tables with the means. These standard errors are presented separately because it is typically not possible to construct simple generalized sampling error tables for means. The standard errors of means can also be used to construct confidence intervals, and the reader is similarly urged to consider these standard errors when examining means.

Table 4.1

APPROXIMATE STANDARD ERRORS OF ESTIMATED PERCENTAGES FOR CHAPTER 4

Row	Type of staff / No. cases in sample / Estimated Percentage	Estimated Standard Error (in percentage points)										
		Directors	Instructors					Counselors				
		N = 48	N = 7	50	65	79	154	N = 18	27	32	43	84
		A	B	C	D	E	F	G	H	I	J	K
1	5 or 95	2.3	6.4	2.4	2.1	1.9	1.4	3.7	3.0	2.7	2.4	1.7
2	10 or 90	3.9	10.8	4.0	3.6	3.2	2.3	6.2	5.1	4.7	4.0	2.9
3	15 or 85	5.2	14.4	5.4	4.7	4.3	3.1	9.1	7.4	6.8	5.9	4.2
4	20 or 80	6.0	16.6	6.2	5.4	4.9	3.5	10.4	8.5	7.8	6.8	4.8
5	25 or 75	6.6	18.8	7.0	6.2	5.6	4.0	12.2	9.9	9.1	7.9	5.6
6	30 or 70	7.1	20.2	7.5	6.6	6.0	4.3	13.0	10.6	9.8	8.4	6.0
7	35 or 65	7.4	21.1	7.9	6.9	6.3	4.5	13.7	11.2	10.2	8.8	6.3
8	40 or 60	7.7	21.8	8.2	7.2	6.5	4.7	14.1	11.5	10.6	9.1	6.5
9	45 or 55	7.8	22.3	8.4	7.3	6.6	4.8	15.1	12.3	11.3	9.8	7.0
10	50	7.8	22.6	8.4	7.4	6.7	4.8	15.2	12.4	11.4	9.8	7.0

NOTE: This table contains estimates of approximate standard errors applicable to the majority of estimated percentages contained in Chapter 4. The table was constructed to provide a general order of magnitude of the sampling errors of estimated percentages, and is based on the results of a number of different sampling error calculations. The formulas and procedures used in these calculations are detailed in Appendix B.

To use the table in determining the approximate standard error for an estimated percentage one must first identify the appropriate row and column to use. Select the row that most nearly corresponds to the value of the estimated percentage. Row 1 would be used for estimated percentages near 5% or 95%, row 2 for estimated percentages near 10% or 90%, etc. Then select the applicable column according to the type of staff member and the number of sample cases (N) on which the estimated percentage is based.

For Directors use:
Column A

For Instructors use:
Column B for N = 7
C for N = 50
D for N = 65
E for N = 79
F for N = 154

For Counselors use:
Column G for N = 18
H for N = 27
I for N = 32
J for N = 43
K for N = 84

For example, to determine the approximate standard error of the estimated 46.6 percent found in Table 4.3 as the percentage of project counselors who are female, one would first identify row 9 as the appropriate row. Row 9 is selected because 46.6 percent is closer to the 45 percent of row 9 than to any of the other percents listed in the "Estimated Percentage" column above. Column F is selected because the estimated percentage applies to counselors and is based on a sample size of 84. Using row 9 and column F, the approximate standard error of the estimated 46.6 percent is found to be 7.0 percentage points.

C. Other Sources of Error

Another important source of error, not related to sampling, needs to be mentioned. The descriptions of the UB program and staff presented in Chapters 4, 5, and 6 are based entirely on the opinions and perceptions of UB staff and students. No other data were used. Much of the information obtained is objective in nature, and thus subject only to the usual types of response error that enter into any set of survey responses. But some of the data represent subjective evaluations of various aspects of the projects by UB staff and participants, and hence are more likely to be affected by a conscious or subconscious tendency to place one's own project in a favorable light (presumably within individually perceived limits of realism). Therefore, particularly in considering these subjective results, the reader must keep in mind that the descriptions of UB being presented are the results of a questionnaire survey and have not been externally validated.

II. DEMOGRAPHIC CHARACTERISTICS OF THE UB PROJECT STAFF

One domain of staff characteristics that may have an impact on program operation is that of demographic and background attributes. The guidelines for the UB program suggest, for example, that an attempt be made to match the ethnicity of project staff to that of the students being served. There are some intuitive arguments for a matching of staff and students on other dimensions, since a staff member with a background similar to that of the student would certainly have a potentially better understanding of the problems of that student. This subsection describes the age, sex, ethnicity, and background of UB project directors, instructors, and counselors, as estimated for the national UB staff.

Age. Table 4.2 shows the age distribution of the three categories of UB staff members. The project directors tended to be slightly older than the instructors or counselors, although most persons regardless of staff category were in their twenties or thirties. It can be seen that 56 percent of the project directors, 65 percent of the instructors, and 70 percent of

Table 4.2

AGE OF UB PROJECT STAFF MEMBERS

Age in Years	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
25 or less	5.4	18	3	15.9	472	24	45.6	540	27
26–35	51.0	166	25	48.8	1450	70	24.6	291	29
36–45	31.2	102	14	17.2	512	28	16.1	190	14
46–55	10.5	34	5	14.0	415	23	10.4	123	10
56–65	1.9	6	1	3.5	104	8	3.4	40	4
Indeterminate[c]	—	—	—	0.7	20	1	—	—	—
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 2.a; PIQ question 1; PCQ question 1. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.3

SEX OF UB PROJECT STAFF MEMBERS

Sex	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Male	88.1	287	41	55.2	1641	89	53.4	633	42
Female	11.9	39	7	43.8	1303	63	46.6	551	42
Indeterminate[c]	—	—	—	1.0	30	2	—	—	—
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 2.b; PIQ question 2; PCQ question 2. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

the counselors were younger than 36. The large proportion of counselors younger than 26 may reflect the fact that college students served as "tutor-counselors" at some UB summer programs. In sampling, these tutor-counselors were classified in the counselor category.

Sex. Table 4.3 provides the percentage distribution by sex of the three types of staff. Nearly all (88 percent) of the directors were male, and the majority of staff members in the other two categories were also male (55 percent of the instructors and 53 percent of the counselors).

Ethnicity. Table 4.4 tabulates the percentage distribution of the project staff members by their ethnicity. The greatest proportion of project directors were black (47 percent), while the greatest proportion of counselors and instructors were white (42 percent and 55 percent, respectively). Thirteen percent of the project directors, 21 percent of the counselors, and less than 6 percent of the instructors were Mexican-Americans. Indians were represented in all three staff categories, comprising 6 percent of the directors, 3 percent of the counselors, and 4 percent of the instructors. Puerto Ricans and Orientals were represented infrequently and only among the instructors.

Community Background. The type of communities in which staff members lived, both through completion of high school and since their high school years, is shown in Table 4.5. As youths, most staff members lived in cities, outnumbering rural or reservation areas by 3 to 1 through 5 to 1, depending on staff category. Since their high school years, even more staff members moved to the city, with ratios of city to other types of residences ranging from 9 to 1 for counselors and instructors and 18 to 1 for directors.

Family Background. Table 4.6 displays the educational attainment of staff members' fathers and mothers. The educational level of parents of most staff members ranged from grade school to graduate school, with that of the mothers slightly higher than that of fathers for counselors and instructors. About 25 percent of the project directors' fathers had obtained a BA degree or higher, compared to 18 percent for instructors and 9 percent for counselors. Eighteen percent of the project directors' mothers obtained at least a BA degree as compared to 19 percent for instructors, and 11

Table 4.4

ETHNICITY OF UB PROJECT STAFF MEMBERS

Ethnicity	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Black	46.7	152	23	32.7	973	54	34.4	407	38
Indian	6.0	19	3	4.3	128	5	2.6	30	2
Oriental	—	—	—	0.5	15	1	—	—	—
Mexican-American	13.1	43	5	5.5	164	9	21.2	251	10
Puerto Rico	—	—	—	0.5	16	1	—	—	—
White	34.2	112	17	55.1	1639	81	41.8	495	34
Indeterminate[c]	—	—	—	1.4	39	3	—	—	—
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1183	84

NOTE: Table based on responses to PDQ question 3; PIQ question 3; PCQ question 3. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.5

COMMUNITY OF RESIDENCE OF UB PROJECT STAFF

Type of Community	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Through High School									
Rural/ Reservation	24.2	79	11	16.4	488	29	25.4	300	23
City	71.4	233	35	79.9	2372	119	71.0	841	58
Indeterminate[c]	4.5	15	2	3.8	114	6	3.6	43	3
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84
Since High School									
Rural/ Reservation	5.1	17	3	9.1	271	16	9.6	114	12
City	88.2	287	42	83.9	2501	127	79.9	947	66
Indeterminate[c]	6.8	22	3	6.8	202	11	10.4	124	6
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 5; PIQ question 5; PCQ question 5. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.6

HIGHEST EDUCATIONAL LEVEL OF FATHERS AND MOTHERS OF UB STAFF MEMBERS

Educational Level	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Educational Level of Fathers									
None or some grade school	16.2	53	9	10.8	320	18	16.2	192	11
Finished grade school or some high school	37.7	123	16	30.4	904	47	26.3	312	25
Finished high school, trade school or some college	18.6	61	9	40.5	1204	60	45.4	539	38
B.A., Professional School, M.A., or Ph.D.	25.2	83	13	17.7	527	27	8.5	102	7
Indeterminate[c]	2.2	7	1	0.6	19	2	3.5	41	3
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84
Educational Level of Mothers									
None or some grade school	13.1	43	5	3.0	89	6	14.0	165	13
Finished grade school or some high school	32.1	105	15	36.0	1070	56	18.7	221	15
Finished high school, trade school or some college	34.3	113	18	41.8	1241	64	52.6	623	42
B.A., Professional School, M.A., or Ph.D.	18.3	60	9	18.7	555	26	11.2	133	11
Indeterminate[c]	2.2	7	1	0.6	19	2	3.5	42	3
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 6; PIQ question 6; PCQ question 6. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

percent for counselors. Table 4.7 tabulates the types of occupation held by staff members' parents. Staff members' fathers were principally laborers or service workers[7] of some type (48 percent, 39 percent, and 37 percent for directors, instructors, and counselors, respectively), while the mothers tended to be homemakers and laborer/service workers (38 and 35 percent, respectively, for directors; 52 and 20 percent for instructors; and 40 and 19 percent for instructors). Further, 20 percent of the directors' fathers were professionals.[8] This category also accounted for 15 percent of the instructors' fathers and 15 percent of the counselors' fathers. Mothers of 10 to 12 percent of the staff members were professionals, while 11 percent or fewer of the mothers were in sales or managerial positions.

As a group, the UB staff members are young and show a diversity of ethnicity that reflects qualitatively, if not quantitatively, the diversity among UB participants. Among the staff categories, the ethnic distribution of project directors is most similar to that of students as reported by the UB data system for program years 1973-74 and as observed in this study (see Chapter 7, Table 7.1). Even among project directors, however, there appear disproportionately few black staff members for a program which serves about 60 percent black students; however, the 95 percent confidence interval for proportion of black project directors does include the value of 60 percent. Observations during site visitation also indicated proportionately smaller representation of blacks on the staff than among the students.

The majority of staff members are male, while participants are mostly female (as indicated in figures reported by USOE and the estimates from this study); however, with the exception of project directors, the confidence intervals for percentage of male staff members include values less than 50 percent. Family backgrounds of UB staff seem fairly diverse, with many staff members providing data which is suggestive of origins in a low

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[7] The category of laborer and service worker is exemplified by factory, farm, mine, or construction workers; bus, taxi, or truck drivers; waiters or waitresses; cooks; maids; custodians; guards, policemen; firemen; beauticians; seamstresses; and practical nurses or orderlies.

[8] Including teachers, doctors, engineers, lawyers, social workers, accountants, musicians, artists, dentists, librarians, and writers.

Table 4.7

OCCUPATION OF FATHERS AND MOTHERS OF UB STAFF MEMBERS

Occupations	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Work of Fathers									
Laborer/Service Worker	47.5	155	24	38.6	1148	60	36.6	434	33
Craftsman	18.8	61	8	19.6	583	23	15.5	183	13
Sales	0.0	--	--	7.9	234	13	5.2	61	6
Manager	13.7	45	6	14.0	416	23	23.9	283	18
Professional	20.1	65	10	15.4	457	23	15.3	181	9
Homemaker	0.0	--	--	--	--	--	0.6	8	1
Indeterminate[c]	0.0	--	--	4.5	135	7	2.9	34	4
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84
Work of Mothers									
Laborer/Service Worker	35.2	115	16	19.5	581	33	18.9	224	22
Craftsman	0.0	--	--	3.4	100	2	0.0	--	--
Sales	6.6	22	4	2.8	83	6	10.9	129	10
Manager	4.6	15	1	2.2	67	3	10.6	125	5
Professional	12.2	40	7	11.3	336	17	10.6	126	11
Homemaker	37.8	123	18	52.4	1559	77	40.4	479	29
Indeterminate[c]	3.6	12	2	8.2	249	16	8.6	102	7
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 7; PIQ question 7; PCQ question 7. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

income family. Many other staff members, however, report family information that does not seem concordant with the background of the UB target population.

It should be pointed out that the UB program guidelines do not require exact proportionality of staff and students in terms of ethnicity, nor do the guidelines require the staff to match students in family background or sex. There are, however, some arguments for better matching of staff and student ethnicity and background.

III. EDUCATIONAL BACKGROUND, TRAINING, AND EXPERI[illegible] OF THE UB PROJECT STAFF

A natural question regarding the UB staff, and one with obvious implications, concerns the qualifications they bring to their job. The staff questionnaires thus contained several items designed to measure various aspects of such qualifications. This section describes the educational background and relevant occupational skills, training, and experience of project directors, instructors, and counselors.

A. Past and Current Formal Education

Table 4.8 shows the highest formal educational level attained by UB project staff members. Tabulations show that 75 percent of the project directors had obtained at least a master's degree, 14 percent had obtained a Ph.D. degree, and none had less than a B.A. degree. About 68 percent of the instructors had obtained a master's degree or higher, 6 percent had obtained a Ph.D. degree, and only 3 percent had not completed a college degree. Project counselors reported that 48 percent had obtained a master's degree or higher, none had a Ph.D. degree, and 15 percent had less than a Bachelor's degree.[9]

In general, then, the UB directors, instructors, and counselors were primarily college graduates. Further, Table 4.9 indicates that sizeable proportions of the staff members were participating in continuing education at the time they completed the questionnaires. At that time, about 30

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[9] The inclusion of college students, serving as tutor-counselors, in the counselor category has probably inflated this figure.

Table 4.8

HIGHEST EDUCATIONAL LEVEL OBTAINED BY UB PROJECT STAFF

Educational Level	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
No college degree	0.0	--	--	3.4	102	4	11.3	134	5
Degree based on less than 4 years work	0.0	--	--	--	--	--	3.7	44	1
B.A. degree	21.3	69	11	27.0	803	43	36.3	430	25
M.A. degree	50.8	165	25	51.0	1517	74	42.5	504	46
Specialist diploma	9.4	31	5	11.6	344	21	6.0	72	7
Ph.D. degree	14.5	47	6	5.5	163	10	0.0	--	--
Indeterminate[c]	4.0	13	1	1.5	45	2	0.0	--	--
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 8; PIQ question 8; PCQ question 8. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.9

CURRENT ENROLLMENT IN A DEGREE PROGRAM BY UB PROJECT STAFF

Currently Enrolled	Project Director			Project Instructor			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Yes	30.3	99	16	33.7	1003	49	44.7	530	32
No	66.8	218	31	65.5	1948	103	54.2	642	51
Indeterminate[c]	2.9	9	1	0.8	23	2	1.0	12	1
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 10; PIQ question 10; PCQ question 10. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

percent of the project directors, 34 percent of the instructors, and 45 percent of the counselors[10] were enrolled in a degree program.

B. Position-Related Training

As shown in Table 4.10, the majority of project directors and counselors (81 percent and 57 percent, respectively) and a large proportion of the project instructors (39 percent) had attended some type of training institute offering special training in teaching, counseling, or program administration for "disadvantaged" students. A good deal of this training seems to have been received after entrance into a UB staff position. Table 4.11 shows the percentage distributions of project directors and counselors by their attendance in such training institutes since becoming UB staff members; 59 percent of project directors, and 37 percent of counselors had attended such training institutes since joining the UB staff.[11] Table 4.12 tabulates the percentage of instructors who had received UB in-service training. Forty-one percent of the instructors reported some form of in-service training since their first association with the UB program.

Table 4.13 tabulates the numbers of various types of college counseling courses (semester equivalent) that UB counselors had completed. Eighty-seven percent had completed some course work in educational counseling, and 44 percent had completed four or more such courses. The following proportions reported having had at least one course in the remaining areas of counseling: minority group counseling, 52 percent; personal counseling, 76 percent; vocational counseling, 66 percent; and other counseling, 11 percent.

Table 4.14 indicates the number of hours of supervised counseling practice reported by counselors in each of several areas. About 75 percent had some supervised training in educational counseling; 67 percent in

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[10] The inclusion of college students, serving as tutor-counselors, in this counselor category has probably inflated this figure. It should be recalled that 15 percent of the counselors had not completed a B.A. degree.

[11] Considering that only 27 percent of the project directors reported never having attended a training institute (Table 4.10) and 42 percent reported not having attended since becoming a UB staff member (Table 4.11), it follows that 15 percent of the directors had participated in this type of training prior to to their joining the UB staff and not since. Similarly, for counselors, participation in such training only prior to association with UB was restricted to 20 percent.

Table 4.10

UB STAFF ATTENDANCE IN TRAINING INSTITUTES OFFERING SPECIFIC TRAINING IN TEACHING, COUNSELING, OR PROGRAM ADMINISTRATION FOR "DISADVANTAGED" STUDENTS

	Project Director			Project Instructor			Project Counselor		
Attended Training Institute	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Yes, one	28.8	68	11	22.0	653	32	32.8	388	22
Yes, more than one	51.8	169	24	17.1	507	32	23.9	284	26
No	27.4	89	13	60.7	1086	89	42.8	507	35
Indeterminate[c]	0.0	--	--	0.2	7	1	0.5	6	1
Totals[d]	100.0	326	48	100.0	2973	154	100.0	1184	84

NOTE: Table based on responses to PDQ question 11.a; PIQ question 11; PCQ question 11.a. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.11

ATTENDANCE IN POSITION RELATED TRAINING INSTITUTES SINCE BECOMING UB PROJECT STAFF MEMBER

Attendance in Training Institutes	Project Director			Project Counselor		
	%[a]	WN	N[b]	%[a]	WN	N[b]
None	41.5	135	20	63.4	751	54
One	17.2	56	9	23.9	282	18
More than one	41.3	135	19	12.8	151	12
Totals[c]	100.0	326	48	100.0	1184	84

Note: Table based on responses to PDQ question 11.b; PIQ question 11.b; PCQ question 11.b. For approximate standard errors of percents, refer to Table 4.1, columns A, F, and K, respectively, for project directors, instructors, and counselors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.12

INSERVICE TRAINING OF UB PROJECT STAFF INSTRUCTORS

Inservice Training	%[a]	WN	N[b]
Had participated[c]	41.2	1224	60
Had not participated	49.7	1479	80
Indeterminate[d]	9.1	270	14
Totals[e]	100.0	2973	154

NOTE: Table based on responses to PIQ question 23a. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Category includes analysis imputations.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.13

NUMBER OF COLLEGE COURSES SPECIFICALLY RELATED TO COUNSELING COMPLETED BY UB COUNSELORS

Type of Counseling Course	Number of Courses[a]	%[b]	WN	N[c]
Educational Counseling	0	11.6	138	9
	1-3	42.9	509	32
	4 or more	44.3	524	42
	Indeterminate[d]	1.1	13	1
	Total[e]	100.0	1184	84
Minority Group Counseling	0	36.7	434	28
	1-3	42.9	507	39
	4 or more	9.1	108	8
	Indeterminate[d]	11.3	134	9
	Total[e]	100.0	1184	84
Personal Counseling	0	15.4	182	11
	1-3	44.4	524	36
	4 or more	31.2	369	32
	Indeterminate[d]	9.1	108	5
	Total[e]	100.0	1184	84
Vocational Counseling	0	27.9	330	20
	1-3	58.3	691	49
	4 or more	7.2	85	10
	Indeterminate[d]	6.6	79	5
	Total[e]	100.0	1184	84
Other Counseling	0	26.1	309	16
	1-3	7.8	93	10
	4 or more	2.7	32	4
	Indeterminate[d]	63.3	750	54
	Total[e]	100.0	1184	84

NOTE: Table based on responses to PDQ question 12. For approximate standard errors of percents, refer to Table 4.1, column K.

[a] Courses as semester equivalents.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonrespondents.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.14

HOURS OF SUPERVISED COUNSELING PRACTICE EXPERIENCED BY UB COUNSELORS

Type of Counseling	Number of Hours	%[a]	WN	N[b]
Educational Counseling	0	21.8	258	19
	1-20	54.9	651	39
	20 or more	19.6	232	22
	Indeterminate[c]	3.7	44	4
	Total[d]	100.0	1184	84
Minority Group Counseling	0	33.8	400	27
	1-20	34.8	412	28
	20 or more	17.6	209	16
	Indeterminate[c]	13.7	163	13
	Total[d]	100.0	1184	84
Personal Counseling	0	24.5	290	18
	1-20	38.2	452	31
	20 or more	28.6	339	28
	Indeterminate[c]	8.7	103	7
	Total[d]	100.0	1184	84
Vocational Counseling	0	38.3	454	27
	1-20	37.9	449	36
	20 or more	13.4	159	12
	Indeterminate[c]	10.4	123	9
	Total[d]	100.0	1184	84
Other Counseling	0	31.9	377	22
	1-20	6.6	77	8
	20 or more	3.2	38	4
	Indeterminate[c]	58.5	693	50
	Total[d]	100.0	1184	84

NOTE: Table based on responses to PCQ question 13. For approximate standard errors, refer to Table 4.1, column X.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

personal counseling; 52 percent in minority group counseling; and 51 percent in vocational counseling.[12]

Table 4.15 presents the types of teaching certificates held by UB instructors. About 75 percent of the instructors had some form of teaching certificate, including 5 percent (of the total) who held a temporary or provisional certificate. The highest teaching certificate offered by the state was held by 48 percent of the instructors.

C. Position-Related Experience

Most UB project directors had several years of experience working with disadvantaged students either in an administrative capacity or in some other capacity. Table 4.16 shows the total experience[13] of project directors with programs for disadvantaged students. It can be seen that 76 percent of the project directors had accumulated three or more years of experience in administering programs for disadvantaged youth, and 56 percent had at least five years of experience. Further, 23 percent of the project directors reported three or more years of additional experience, other than administrative, in working with disadvantaged youth, and 52 percent stated at least one year of experience in this capacity.

Tables 4.17 and 4.18 show the types of programs in which UB directors had gained their administrative and nonadministrative experience, respectively. It can be seen that the directors had obtained most of their experience in both areas from their current UB positions. A majority of the directors either had no previous experience in such programs, or did not respond.[14]

UB project instructors were asked to indicate their experience teaching in full-time and part-time positions. Table 4.19 shows that 82 percent of the instructors reported one or more years' experience teaching full-time,

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[12] These percentages were probably somewhat deflated by the inclusion of tutor-counselors, who were college students, in the counselor category.

[13] The total experience was determined for each UB director by aggregating over the categories: his present UB project, another UB project, a Talent Search project, and other projects.

[14] The rates of item nonresponse were very high for the categories other than "the present UB project."

Table 4.15

TYPE OF TEACHING CERTIFICATE HELD BY UB STAFF INSTRUCTORS

Type of Certificate	%[a]	WN	N[b]
Not certified	25.0	744	39
Temporary, provisional	4.9	145	7
Regular certificate, but less than highest offered by state	20.2	601	31
Highest teaching certificate offered by the state	48.4	1438	74
Indeterminate[c]	1.5	46	3
Totals[d]	100.0	2974	154

NOTE: Table based on responses to PIQ question 12. For approximate standard errors, refer to Table 4.1, column F.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.16

TOTAL EXPERIENCE OF UB PROJECT DIRECTORS IN PROGRAMS FOR DISADVANTAGED YOUTH

	In Administrative Capacity			In Other Than Administrative Capacity		
Years of Experience	%[a]	WN	N[b]	%[a]	WN	N[b]
Indeterminate[c]	—	—	—	33.7	110	14
Less than 1	7.2	23	4	14.4	47	8
1 or 2	16.5	53	9	28.5	93	14
3 or 4	20.8	67	10	7.7	25	4
5 or 6	38.2	125	18	7.6	25	4
7 or more	17.4	56	7	8.1	27	4
Totals[d]	100.0	326	48	100.0	326	48

NOTE: Table based on aggregate data of responses to PDQ questions 1.b and 1.c. For approximate standard errors of percents, refer to Table 4.1, column A.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.17

EXPERIENCE OF UB PROJECT DIRECTORS IN ADMINISTRATION OF PROGRAMS FOR DISADVANTAGED YOUTH

Years of Experience	%[a]	WN	N[b]
A. As Project Director of This UB Project			
Less than 1	26.4	86	13
1-2	21.6	70	12
3-4	25.5	83	12
5 or more	26.5	86	11
Total[c]	100.0	326	48
B. As Project Director of Another UB Project			
One	46.1	150	21
Less than 1	2.6	8	1
1 or more	6.5	21	3
Indeterminate[d]	44.8	146	2[illegible]
Total[c]	100.0	326	48
C. As Director of TS Project			
One	41.4	135	18
Less than 1	4.4	14	3
1 or more	1.9	6	1
Indeterminate[d]	52.3	171	26
Total[c]	100.0	326	48
D. As Director of Other Projects Serving Disadvantaged Youth			
One	21.5	70	10
Less than 1	8.0	26	5
1-2	19.4	63	10
3-4	16.2	53	7
5 or more	3.8	12	1
Indeterminate[d]	31.2	102	15
Total[c]	100.0	326	48

NOTE: Table based on responses to PDQ question 1.b. For approximate standard errors of percents, refer to Table 4.1, column A.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.18

EXPERIENCE OF UB PROJECT DIRECTORS WITH PROGRAMS FOR DISADVANTAGED YOUTH IN OTHER THAN ADMINISTRATIVE CAPACITY

Years of Experience	%[a]	WN	N[b]
A. In Some Capacity Other Than Director of This UB Project			
One	42.7	139	19
Less than 1	13.4	44	7
1-2	23.6	77	11
3-4	1.8	6	1
5 or more	5.8	19	4
Indeterminate[c]	12.6	41	6
Total[d]	100.0	326	48
B. In Some Capacity Other Than Director of Another UB Project			
One	50.2	170	24
One	3.7	12	2
Indeterminate[c]	44.3	144	22
Total[d]	100.0	326	48
C. In Some Capacity Other Than Director of TS Project			
One	52.0	170	24
Less than 1	1.9	6	1
Indeterminate[c]	46.1	150	23
Total[d]	100.0	326	48
D. In Some Capacity Other Than Director of Other Project Serving Disadvantaged Youth			
One	33.1	108	14
Less than 1	6.4	21	4
1-2	14.7	48	8
3-4	5.9	19	3
5 or more	8.1	26	3
Indeterminate[c]	31.8	104	16
Total[d]	100.0	326	48

NOTE: Table based on responses to PDQ question 1.c. For approximate standard errors of results, refer to Table 4.1, column A.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.19

UB INSTRUCTORS' YEARS OF TEACHING EXPERIENCE IN FULL-TIME AND PART-TIME POSITIONS

	Full-Time			Part-Time		
Years Experience	%[a]	WN	N[b]	%[a]	WN	N[b]
None	3.1	91	6	8.1	240	12
Less than 1	3.8	114	7	6.1	181	11
1-2	10.4	309	16	15.1	449	17
3-4	10.2	302	16	12.5	372	22
5-9	25.7	765	37	10.1	300	19
10-14	10.6	314	17	2.4	72	3
15-30	22.4	666	34	1.7	52	3
30 or more	2.7	79	7	0.0	--	--
Indeterminate[c]	11.2	332	14	44.0	1307	67
Totals[d]	100.0	2973	154	100.0	2973	154

NOTE: Table based on responses to PIQ question 13. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

and 61 percent had taught at least five years in full-time positions. About half the instructors also had part-time teaching experience.

Table 4.20 tabulates the experience of UB project instructors in UB summer and academic year programs. A large majority (89 percent) of instructors had served in at least one summer program, and almost half the instructors reported experience in at least one academic year program. Table 4.20 also indicates the experience of UB project instructors in teaching minority groups or disadvantaged students prior to joining the UB staff. Over 40 percent of the instructors reported less than one year of experience teaching such students prior to becoming a UB staff member.

UB project counselors were asked to indicate their total experience counseling in full-time and part-time positions. As seen in Table 4.21, 61 percent of the counselors reported one or more years of counseling experience in a full-time position; about 22 percent reported at least five years of full-time counseling. Almost two-thirds of the counselors reported some part-time counseling experience.

The upper panel of Table 4.22 presents the number of summer and academic year sessions of UB experience by project counselors. Well over half the counselors had worked in at least one UB summer program, and about three-fourths of the counselors had served in at least one academic year program. The lower panel of Table 4.22 shows the number of years of experience that project counselors had gained in counseling minority groups or disadvantaged students prior to becoming UB staff members. Less than half the counselors reported a year or more of such experience.[15/]

D. Summary of UB Staff Training and Experience

The results presented in this section strongly indicate that UB staff members were generally well educated and showed a good deal of involvement with furthering their education. They were generally well trained for their particular position in the UB program and showed evidence of continuing

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[15/] Again, the large proportion (57 percent) with less than a year's experience may reflect the presence of college students who served as tutor-counselors in the counselor category.

Table 4.20

EXPERIENCE OF UB PROJECT INSTRUCTORS IN RELATED INSTRUCTIONAL POSITIONS

A. Experience of UB Project Instructors with UB Summer and Academic Year Programs

Program Experience[a]	Summer			Academic Year		
	%[b]	WN	N[c]	%[b]	WN	N[c]
None	6.7	201	11	16.9	504	27
One	30.4	905	51	18.7	553	30
Two	18.3	545	19	8.6	257	14
Three	12.6	373	20	7.0	208	8
Four	10.3	306	20	5.6	165	11
Five or more	17.8	527	29	9.5	282	16
Indeterminate[d]	3.9	116	4	33.8	1004	48
Totals[e]	100.0	2973	154	100.0	2973	154

B. Years Experience Teaching Minority Groups or Disadvantaged Students Prior to Work with UB

Years Experience	%[a]	WN	N[b]
Less than 1	43.1	1280	65
1-2	21.1	626	32
3-4	8.3	245	14
5 or more	26.9	801	42
Indeterminate[d]	0.7	21	1
Totals[e]	100.0	2973	154

NOTE: Table based on responses to PIQ questions 14.a and 15. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] Imputations have been performed on these data.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonrespondents.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.21

UB COUNSELORS' YEARS OF COUNSELING EXPERIENCE IN FULL-TIME AND PART-TIME POSITIONS

Years Experience	Full-Time			Part-Time		
	%[a]	WN	N[b]	%[a]	WN	N[b]
None	12.6	150	8	6.5	76	7
Less than 1	11.5	136	7	21.4	253	15
1-2	28.9	342	24	16.7	198	15
3-4	10.4	123	13	6.7	80	6
5-9	9.3	110	10	14.7	174	13
10-14	12.4	147	12	1.3	15	1
15-30	0.0	--	--	1.7	20	1
30 or more	0.0	--	--	0.7	8	1
Indeterminate[c]	14.9	176	10	30.4	359	25
Totals[d]	100.0	1184	84	100.0	1184	84

NOTE: Table based on responses to PCQ question 14. For approximate standard errors of percents, refer to Table 4.1, column K.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.22

EXPERIENCE OF UB PROJECT COUNSELORS IN RELATED COUNSELING POSITIONS

A. Counseling Experience of UB Counselors in UB Projects

Program Experience	Summer			Academic Year		
	%[a]	WN	N[b]	%[a]	WN	N[b]
None	13.5	160	14	8.5	101	5
1[c]	28.5	338	19	36.2	429	31
2	10.8	128	9	13.6	161	11
3	7.3	86	6	5.7	68	7
4	3.9	46	3	0.6	7	1
5 or more	9.7	115	12	20.8	246	16
Indeterminate[d]	26.2	312	21	14.6	173	13
Totals[e]	100.0	1184	84	100.0	1184	84

B. Number of Years Counseling Experience of UB Counselors with Minority Groups of "Disadvantaged Students" Prior to Work with UB

Years Experience	%[a]	WN	N[b]
Less than 1	57.4	679	40
1-2	24.5	290	24
3-4	8.5	100	9
5 or more	9.6	114	11
Totals	100.0	1184	84

NOTE: Table based on responses to PIQ questions 15.a and 16. For approximate standard errors of percents, refer to Table 4.1, column K.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Category includes analysis imputations.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

training in their content area. The level of education and training maintained by the project staff, and their continued efforts to further this training and education, clearly suggest that student participants in the UB program were under the direction of capable and qualified project personnel. These results are, of course, based on self-reported and unverified information about the staff members; however, observations made during site visits also indicated that the program was served by highly qualified staff members. Moreover, program guidelines suggest (and observed practices indicate that this suggestion is followed) that UB staff be recruited from the staff of "feeder" high schools and host institutions, which would typically produce a high level of training and formal education.

The reported results, as well as results of interviews during site visitation, suggest that the UB staff possessed a good deal of practical experience in their professional field of work; however, much of their experience in working with poverty level and academic risk students seems to have been gained while associated with the UB program. Lack of experience with the program on the part of some staff members is understandable in light of: (1) the relatively short timespan that some projects had been in operation, and (2) a program policy that suggests turnover of one third of the instructional staff every year. Although this suggestion of rotating staff avoids problems of self-perpetuating mediocrity, it also has potential for being counterproductive in terms of experience with the target population students among UB staff members, particularly in light of the finding that a good deal of such experience is gained only through association with the program. During site visitation, project directors expressed similar concerns.

IV. WORK ACTIVITIES AND WORKLOADS OF UB PROJECT STAFF

The particular activities to which the UB staff members allocated their working time and the extent of the functions they performed are important features of a national description of project staff. For this reason, several items of the staff questionnaire were directed to this matter.

This section describes the ways in which the UB project directors, instructors, and counselors allocated their time among project activities. It also discusses the extent to which instructors and counselors were employed by UB, the nature of their other employment, and their UB workloads and instructional practices.

A. Actual and Ideal Distribution of Time

An item in all staff questionnaires[16/] asked respondents to distribute 100 percent of their UB working time among a list of activities (for both the 1973 summer and 1973-74 academic year programs). Respondents were asked to give not only the actual distribution of their time, but also the distribution which they thought would be ideal. The results are presented in terms of the median percent time spent on the activities (actual or ideal) during the summer and academic year programs.[17/] Although medians do not possess some of the desirable properties of means,[18/] they are less affected by extreme values and for these data are considered to provide a more realistic description of time allocation.

Table 4.23 presents the actual and ideal time allocation for project directors. As shown in the table, the single activity taking up the greatest proportion of the project directors' time during both the summer and the academic year was general administration (budget management, staff supervision, report writing, etc.), requiring 40 percent of their time during the summer and 35 percent during the academic year. The next most time-consuming activity was counseling students, to which they devoted 15 percent and 10 percent of their time during the summer and academic year, respectively. The activity to which project directors devoted the least

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[16/] Question 18 of the PDQ, 26 of the PIQ, and 28 of the PCQ.

[17/] The median percent of time spent on a given activity is simply the midpoint of the distribution of percentages reported by the individual staff members (i.e., that percentage value such that half of the responses given are greater than that value and half are less than that value).

[18/] Unlike arithmetic averages, median percentage values are not constrained to add to 100 percent even though individual response did account for 100 percent of time. Further, the median difference of two variables does not necessarily equal the difference between the respective medians of the variables.

Table 4.23

MEDIAN PERCENT OF WORKING TIME ACTUALLY AND IDEALLY SPENT
BY PROJECT DIRECTORS ON VARIOUS ACTIVITIES

Activities	1973 Summer Program		1973-74 Academic Program	
	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]
General administration	39.7	26.1	35.3	25.1
Recruit/selection of students	7.7	5.2	9.7	9.8
Recruit/selection of staff	4.7	4.7	5.0	5.1
Instructing students	0.4	0.4	0.4	0.4
Counseling students	14.7	15.3	10.1	15.2
Working with parents	5.1	8.7	5.1	9.7
Dealing with community representatives	4.9	4.9	5.0	5.2
Dealing with host institution	5.4	5.2	5.2	5.2
Deal with other postsecondary and secondary schools	6.1	5.5	9.9	9.9
Dealing with regular offices	4.5	1.7	4.7	4.5
Number of cases (weighted)[b]	269	259	273	245
Number of cases (unweighted)[b]	39	37	42	37

NOTE: Table based on responses to PDQ question 18. Medians are based on weighted responses, adjusted for instrument nonresponse. Adjustments for indeterminate responses to each item (item nonresponse, multiple or inconsistent responses) were not made; reported values were computed for subset of responses only. Standard errors were not computed for these data.

[a] Median percents are not constrained to sum to 100, even though individuals' responses did account for 100 percent of their time.

[b] The number of respondents on which median values were computed.

time was instructing students (less than half a percent in each session). All other activities required about 5 to 10 percent of the project directors' time. In general, the proportions of time taken up by the various activities were quite similar during the summer and academic year. These average results are compatible with observations made during site visitation, but considerable diversity of actual time allocation among projects was observed both during site visits and in the questionnaire responses.

Actual and ideal time allocations for instructors are presented in Table 4.24. It is seen that in both the summer and academic year programs, the bulk of instructor time was spent, as expected, in teaching or tutoring (the median reported percentage was 50 percent for the summer and 70 percent for the academic year). The only other activities to which the instructors devoted a substantial proportion of their time in either session were counseling students and conferring with teachers and other project staff. The instructors spent less than three percent of their time on each of the remaining activities. This finding is also in agreement with observations and unstructured interviews with instructors during site visitation.

The allocation of time by counselors is presented in Table 4.25. As expected, the activity to which counselors devoted the greatest percent of time, in either session, was counseling students. Individual and group counseling, respectively, took up 18 and 10 percent of the counselors' time in the summer and 20 and 10 percent in the academic year. Other summer activities accounting for over 9 percent of the counselors' time included teaching or tutoring and conferring with teachers and other UB staff.[19/] In the academic year, these two activities were not as demanding; less than 1 percent of the counselors' time was devoted to teaching or tutoring, and 5 percent was spent conferring with UB staff. A broad diversity of counselor activity was also reported in interviews with counselors during the site visits; however, the proportion of time spent in actual counseling was generally reported as greater than the median questionnaire reports. It is

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[19/] It may be because of the presence of tutor-counselors, who worked primarily during the summer, among the counselor group that "teaching or tutoring" accounted for this considerable median percent of counselors' time.

Table 4.24

MEDIAN PERCENT OF WORKING TIME ACTUALLY AND IDEALLY
SPENT BY INSTRUCTORS ON VARIOUS ACTIVITIES

Activities	1973 Summer Program		1973-74 Academic Program	
	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]
Individual counseling	9.7	10.2	4.9	9.9
Group counseling with students	2.5	4.8	0.5	5.0
Conferences with parents	0.2	1.8	0.3	0.6
Conferences with teachers and other project staff	5.3	5.3	4.9	5.2
Conferences with sending high school staff	0.1	0.2	0.1	0.3
Orientation of students/staff	2.4	4.0	0.3	0.6
Teaching/tutoring	50.4	50.2	69.7	50.1
Supervising tutors/counselors	0.3	0.3	0.1	0.2
Community and/or agency liaison	0.1	0.1	0.2	0.2
Writing (reports, case studies, etc.)	2.5	2.1	0.3	0.3
Recordkeeping and clerical work	2.5	1.2	0.9	0.4
Number of cases (weighted)[b]	2321	1905	941	862
Number of cases (unweighted)[b]	117	96	55	50

NOTE: Table based on responses to PIQ question 26. Medians are based on weighted responses, adjusted for instrument nonresponse. Adjustments for indeterminate responses to each item (item nonresponse, multiple or inconsistent responses) were not made; reported values were computed for subset of responses only. Standard errors were not computed for these data.

[a] Median percents are not constrained to sum to 100, even though individuals' responses did account for 100 percent of their time.

[b] The number of respondents on which median values were computed.

Table 4.25

MEDIAN PERCENT OF WORKING TIME ACTUALLY AND IDEALLY SPENT BY COUNSELORS ON VARIOUS ACTIVITIES

Activities	1973 Summer Program		1973-74 Academic Program	
	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]	Median Actual Percent of Time[a]	Median Ideal Percent of Time[a]
Individual counseling	18.1	19.8	20.3	25.3
Group counseling with students	9.5	5.3	9.7	10.2
Conferences with parents	0.4	3.1	4.8	5.3
Conferences with teachers and other project staff	9.6	6.0	5.3	5.1
Conferences with sending high school staff	0.3	1.7	4.9	3.3
Orientation of students/staff	5.2	4.9	4.9	4.9
Teaching/tutoring	10.5	14.9	0.5	5.0
Supervising tutors/counselors	2.0	2.5	0.4	0.4
Community and/or agency liaison	0.3	0.5	0.5	2.3
Writing (reports, case studies, etc.)	4.9	3.2	5.3	4.9
Recordkeeping and clerical work	2.7	1.7	5.1	4.7
Number of cases (weighted)[b]	823	719	720	647
Number of cases (unweighted)[b]	54	47	52	48

NOTE: Table based on responses to PCQ question 23. Medians are based on weighted responses, adjusted for instrument nonresponse. Adjustments for indeterminate responses to each item (item nonresponse, multiple or inconsistent responses) were not made; reported values were computed for subset of responses only. Standard errors were not computed for these data.

[a] Median percents are not constrained to sum to 100, even though individuals' responses did account for 100 percent of their time.

[b] The number of respondents on which median values were computed.

quite possible, however, that the inclusion of data from tutor-counselors (who worked primarily during the summer) has distorted the questionnaire results.

To this point, discussion has focused on the median percentages of time that the three staff groups reported actually spending in a variety of activities. A question of perhaps greater interest concerns whether the staff members are spending their time in ways that they consider optimal. While some insight into these questions may be obtained from the reported values in Tables 4.23 through 4.25, differences between medians will not (except under unusual conditions) equal the median of individual differences. To investigate whether the project directors, instructors, and counselors allocated more (or less) time than they desired to any activity, the median differences between the actual and ideal percents were determined for each individual. For each respondent on each activity the difference of actual minus ideal time allocation was computed, and the median of these individual differences over staff members was then determined. For all activities, across all three categories of staff, and for each program session, the largest median difference (found for general administration by project directors in the summer) was +4.6. All other median differences fell in the range of -2.1 to 0.5. The small median differences indicate that there was no trend among directors, instructors, or counselors to perceive any of the listed activities as requiring more or less of their time than they felt it should.[20/]

The absolute ranges of the individual differences were, however, relatively large. In most cases, the largest difference at one extreme

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[20/] A median difference near 0 does not indicate that all project directors spent their time in ways that nearly fit their ideal; rather it indicates that there is no consistent trend among project staff in viewing a particular activity as either more demanding or less demanding on their time than it should be. By definition of the median, half of the project directors will show a difference of ideal and actual time allocation greater than the reported median difference and half will show a smaller difference.

was -25, and at the other, +27.[21] That is, for most activities in the list, the greatest negative difference (a staff member reporting less time than desired allocated to an activity) was -25 percentage points. And, with few exceptions, the greatest positive discrepancy (a staff member spending more time than desired on an activity) was +27 percentage points. These differences, representing the extremes of the range, were usually observed for very few staff members, and for nearly all activities, half of the staff members showed differences no greater than about ±8 percentage points; and three-fourths exhibited differences no greater than ±11 percentage points. Therefore, not only was there no consistent trend for any listed activity to be regarded as requiring too much or too little of the staff's time, but, for most staff members, the differences found between actual and ideal time allocation were no larger than about 10 percentage points.

In summary, project directors, instructors, and counselors all performed a number of diverse activities in common, especially counseling. Teaching was another important shared activity, principally between instructors and counselors. As would be expected, the greatest proportion of time within a given staff category was spent in activities related to that particular staff position (i.e., general administration for project directors, teaching for instructors, and counseling for counselors). There was no consistent trend for any of the three staff groups to report that they were, as a group, allocating more or less time to any specific activity than they thought ideal. There were some individual staff members reporting distribution of time among the specific activities in ways that were markedly different from an ideal allocation, but for the majority of staff members actual percent of time spent on an activity was discrepant from ideal time allocation to that task by no more than 10 percentage points.

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[21] The exceptions for directors was a range of -16 to 60 for general administration in the summer. For instructors there were 7 exceptions, with ranges of -30 to 40 for individual counseling and recordkeeping in the summer, and parent conferences and recordkeeping in the academic year. The other exceptions were summer teaching/tutoring (-45 to 65); and in the academic year, orientation of students/staff (-91 to 5), and teaching/tutoring (-24 to 90). For counselors, the 4 exceptions included: individual counseling in the summer (-20 to 65) and in the academic year (-50 to 10); group counseling in the summer (-60 to 20); and writing in the academic year (-5 to 35).

B. Nature of UB Employment and Other Employment of Counselors and Instructors

This subsection examines the extent to which UB counselors and instructors were employed by UB and the nature of any other employment of those not employed full-time with the program. Table 4.26 presents the percentage distribution of instructors by the number of hours they were employed by UB weekly. During the 1973 summer program, over half of the instructors were employed full-time by UB, while in the 1973-74 academic year, over one-third did not work for UB and another third were employed less than 10 hours per week. Table 4.27 shows the nature of the other employment of the instructors who were not employed full-time by UB at the time of the survey (spring 1974). Nearly all had other employment, and most worked in other teaching positions, especially in secondary schools (37 percent) and colleges or universities (27 percent). Thus during the academic year, when many UB projects do not offer regular classes, most UB instructors were principally occupied in teaching in secondary or postsecondary schools.

The situation among counselors is quite similar. Table 4.28 shows that during the 1973 summer program, slightly more than half of the counselors were full-time employees of UB, while one-fifth were not working for UB. During the 1973-74 academic year, only one-fourth were working for UB full-time, over one-fifth were not employed by UB, and nearly one-third were employed by UB for less than 10 hours per week.

Of the counselors who were not employed full-time by the program at the time of the survey, at least half were otherwise employed, but another one-fifth failed to answer this question, as seen in Table 4.29. Of those who responded that they were employed, about two-thirds were employed in a helping profession (as counselors, psychologists, social workers, etc.). The 30 percent who reported that they were not employed outside of UB may be primarily the college students serving as tutor-counselors.

The results discussed in this subsection are supported by certain findings of the site visits. Specifically, there was more full-time employment of counselors and instructors in the summer program than in academic year session, but some continuity of staff between the two sessions was maintained (typically by summer staff serving in a part-time capacity

Table 4.26

EXTENT OF UPWARD BOUND EMPLOYMENT OF INSTRUCTORS

Weekly Hours of Employment	1973 Summer			1973-74 Academic Year		
	%[a]	WN	N[b]	%[a]	WN	N[b]
Full-time	51.6	1534	79	5.0	148	7
30-39	8.7	260	14	0.8	23	1
20-29	7.7	230	12	0.7	20	2
10-19	12.2	363	19	2.9	86	6
Less than 10	2.9	86	5	32.8	975	57
Not employed[d]	7.5	224	15	37.8	1124	56
Indeterminate[d]	9.3	276	10	20.0	597	25
Total[e]	100.0	2973	154	100.0	2973	154

NOTE: Table based on responses to PIQ question 16. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This category includes persons who were employed during only one of the two sessions.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percents may not total exactly due to rounding error.

Table 4.27

OTHER EMPLOYMENT OF UPWARD BOUND INSTRUCTORS NOT EMPLOYED FULL-TIME DURING THE 1973-74 ACADEMIC YEAR

Other Employment	%[a]	WN	N[b]
No other employment	2.7	80	5
Teachers, elementary school	3.9	117	5
Teachers, secondary school	36.8	1094	56
Teachers, vocational/technical school	0.5	16	1
Teachers, college/university	27.1	806	44
Teachers, other	7.1	212	11
Other	10.9	323	20
Indeterminate[c]	10.9	326	12
Total [d]	100.0	2973	154

NOTE: Table based on responses to PIQ question 17. For approximate standard errors or percents, refer to Table 4.1, column F.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.28

EXTENT OF UPWARD BOUND EMPLOYMENT OF COUNSELORS

Weekly Hours of Employment	1973 Summer Program			1973-74 Academic Year Program		
	%[a]	WN	N[b]	%[a]	WN	N[b]
Full-time	52.8	625	43	24.4	289	27
30-39	13.8	163	9	5.4	64	2
20-29	2.8	33	4	2.0	23	2
10-19	4.5	53	3	6.3	75	5
Less than 10	0.4	5	2	30.2	358	23
Not employed[c]	20.1	238	22	21.7	257	17
Indeterminate[d]	5.6	66	1	9.9	117	8
Total [e]	100.0	1184	84	100.0	1184	84

NOTE: Table based on responses to PCQ question 17. For approximate standard of errors of percents, refer to Table 4.1, Column K.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This category includes persons who were employed during only one of the two sessions.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.29

OTHER EMPLOYMENT OF UPWARD BOUND COUNSELORS NOT EMPLOYED FULL-TIME DURING THE 1973-74 ACADEMIC YEAR

Other Employment	%[a]	WN	N[b]
No employment outside Upward Bound	29.7	351	18
Employed in "helping" profession (counselor, psychologist, social worker, etc.)	31.8	377	32
Other than helping profession	18.1	215	12
Indeterminate[c]	20.4	242	22
Total [d]	100.0	1184	84

NOTE: Table based on responses to PCQ question 18. For approximate standard errors of percents, refer to Table 4.1, Column K.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

during the academic year). Furthermore, the part-time staff members employed by UB during the academic year seemed to be recruited primarily from the ranks of those already employed in similar occupations.

C. Activities and Workloads of Instructors

This subsection examines the workloads of the UB instructors and their instructional practices. The percentage distributions of the number of classes taught by full-time and part-time instructors in the two sessions of the program are presented in Table 4.30. During the 1973 summer program, full-time instructors taught an average of 2.9 classes, while part-time teachers averaged only slightly fewer classes, 2.4. During the academic year (1973-74), full-time instructors taught an average of 2.2 classes (although this statistic is based on only 7 respondents and thus has a large standard error); part-time teachers taught an average of 2.6 classes.

The distribution of number of classes taught by full-time and part-time instructors during both summer and academic year sessions reflects considerable diversity in instructors' teaching loads. Almost 13 percent of the full-time summer instructors reported teaching one class or less while over 18 percent of the part-time instructors were teaching four or more classes during the same period. While based on such small numbers that the percentages tend to be unstable, the situation seems to be the same during the academic year. Such results seem to reflect the previous finding regarding allocation of instructor time to noninstructional duties (see previous subsection).

Table 4.31 examines the extent to which instructors (part-time and full-time) reported using selected instructional methods in their UB teaching. Of the practices included, the most popular was individualized instruction. Nearly all teachers used it to some degree, and over half reported that they used it to a great extent. Other common practices which were reportedly used to a "great extent" by 30 percent or more of the instructors were seminars or class discussion, open classrooms, and nongraded classes. In contrast, relatively little use was made of competitive and noncompetitive grading systems, team teaching, or grouping students by ability. Smaller proportions reported using those practices, and among those employing them,

Table 4.30

NUMBER OF CLASSES TAUGHT BY FULL-TIME AND PART-TIME INSTRUCTORS

Number of Classes	Full-Time Instructors			Part-Time Instructors		
	%[a]	WN	N[b]	%[a]	WN	N[b]
Summer (1973)						
None	1.0	16	1	3.6	34	2
One	11.7	179	9	28.2	265	13
Two	19.3	297	13	19.2	180	9
Three	40.5	622	28	26.8	251	15
Four	19.7	302	20	11.5	108	4
Five or more	6.6	102	7	7.6	71	4
Indeterminate[c]	1.1	17	1	3.2	30	2
Total[d]	100.0	1535	79	100.0	939	49
Academic Year (1973-74)						
None	33.7	50	1	11.2	124	6
One	10.6	16	1	6.2	69	3
Two	--	--	--	21.2	234	16
Three	13.4	20	1	38.7	427	22
Four	42.3	63	4	10.3	114	8
Five or more	--	--	--	8.0	88	4
Indeterminate[c]	--	--	--	4.3	48	2
Total[d]	100.0	148	7	100.0	1104	61

NOTE: Table based on responses to PIQ question 16 and question 20b. Refer to Table 4.1 for approximate standard errors of percents; for full-time summer percents, see column J; for part-time summer percents, see column H; for full-time academic year percents, see column G; for part-time academic year percents, see column I.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.31

INSTRUCTORS' REPORTED USE OF VARIOUS INSTRUCTIONAL PRACTICES OR TECHNIQUES IN UPWARD BOUND PROJECTS

Type of Technique		Don't use	Use, to a: Small Extent	Moderate Extent	Great Extent	Indeterminate[c]	Total[d]
Lecture	%[a]	20.1	38.8	26.4	9.5	5.2	100.0
	WN	598	1154	786	283	153	2973
	N[b]	29	56	47	14	8	154
Seminar/Class Discussion	%[a]	6.5	22.3	30.4	35.2	5.7	100.0
	WN	194	662	903	1045	169	2973
	N[b]	9	31	48	55	11	154
Programmed Instruction	%[a]	37.0	22.9	20.8	9.9	9.4	100.0
	WN	1099	682	619	294	280	2973
	N[b]	54	36	30	18	16	154
Open Classroom	%[a]	16.7	13.2	31.5	30.7	8.0	100.0
	WN	496	392	936	912	237	2973
	N[b]	26	24	41	49	14	154
Instructional Media (cassette tapes, TV, etc.)	%[a]	23.6	26.0	29.5	15.5	5.4	100.0
	WN	700	774	877	462	160	2973
	N[b]	31	42	46	24	11	154
Individualized Instruction	%[a]	1.1	10.2	29.4	50.8	8.5	100.0
	WN	33	303	874	1512	252	2973
	N[b]	3	16	42	78	15	154
Grouping Students with Various Levels of Ability for Instruction	%[a]	30.3	22.9	21.7	19.2	5.9	100.0
	WN	902	679	646	571	175	2973
	N[b]	46	30	35	33	10	154
Team Teaching	%[a]	48.3	19.1	17.2	8.0	7.4	100.0
	WN	1436	567	512	238	220	2973
	N[b]	68	27	29	15	15	154
Competitive Grading System (A, B, C, etc.)	%[a]	66.2	10.8	12.2	5.5	5.3	100.0
	WN	1970	321	364	162	157	2973
	N[b]	97	17	19	11	10	154
Noncompetitive Grading System (pass/fail, etc.)	%[a]	59.9	11.8	8.8	10.1	9.5	100.0
	WN	1780	351	260	301	281	2973
	N[b]	81	20	14	22	17	154
Nongraded Classes	%[a]	21.0	8.4	13.4	49.1	8.2	100.0
	WN	623	250	398	1459	243	2973
	N[b]	33	15	19	74	13	154

NOTE: Table based on PIQ question 28. Refer to column K of Table 4.1 for approximate standard errors.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonresondents.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Weighted numbers and percentages may not total exactly due to rounding error.

most reported a small or moderate extent of use. Thus, consistent with the UB goals of motivating students to learn and strengthen their self-image, the majority of the teachers gave individualized instruction, did not grade students competitively, and often taught in open classrooms; however, they also relied heavily on the more traditional methods of lectures and class discussions, and to a lesser extent, on the use of instructional media and programmed instruction.

D. Activities and Workload of Counselors

This subsection discusses the workload of the UB counselors (in terms of counseling contacts per week, length of counseling sessions, and number of sessions per student) and the types of counseling conducted. Table 4.32 reports the median percentages of time, out of total student-contact time, that counselors devoted to various student concerns or issues during the 1973 summer and 1973-74 academic year programs. The median proportions of the student-contact time spent on a particular issue were in general quite similar during the two sessions. Although standard errors were not computed for these medians, the data indicate that more time was spent on matters related to postsecondary entry, high school problems, and financial problems during the academic year than in the summer.[22/] In both sessions, entry into four-year colleges, personal and family problems, social and situational problems, high school academic problems, and financial concerns accounted for notable proportions of the counselors' student-contact time.

Table 4.33 presents the percentage distributions of full-time and part-time counselors, by the average number of students counseled per week, during the 1973 summer and 1973-74 academic year programs. Except for group counseling by full-time counselors, more students were counseled per week during the summer than during the academic year. During the summer, the median number of students counseled per week by full-time and part-time counselors, respectively, were 16.3 and 16.2 in individual sessions, and

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[22/] The lesser involvement with financial concerns during the summer program may arise from the situation often discussed during the site visits that students who very much need to earn money do not enroll in the summer program.

Table 4.32

MEDIAN PERCENTAGE OF COUNSELING TIME SPENT ON VARIOUS STUDENT CONCERNS

Areas of Counseling	1973 Summer	1973-74 Academic Year
Career vocation guidance, jobplace, etc.	4.8	5.1
Four-year college entrance	10.8	14.5
Two-year college entrance	3.4	5.1
Postsecondary education other than 2 or 4 year college	0.5	3.1
Personal & family problems	10.4	10.1
Social/situational problems	9.8	8.5
High school attendance	0.5	5.5
High school academic choices	4.8	5.0
High school academic problems	9.8	10.0
Financial concerns	5.1	9.6
Other	0.3	0.2
Number of cases (weighted)	771	781
Number of cases (unweighted)[b]	56	63

NOTE: This table is based on responses to PCQ question 24. Medians are based on weighted responses, adjusted for instrument nonresponse. Adjustments for indeterminate responses to each item (item nonresponse, multiple or inconsistent responses) were not made; reported values were computed for subset of determinate responses only and were further restricted to the counselors responding that they did counseling in each session. Standard errors were not computed for these data.

[a] Median percents are not constrained to sum to 100, even though individuals' responses did account for 100 percent of their time.

[b] The number of respondents on which median values were computed.

Table 4.33

NUMBERS OF DIFFERENT STUDENTS COUNSELED PER WEEK IN INDIVIDUAL AND GROUP COUNSELING SESSIONS BY FULL-TIME AND PART-TIME COUNSELORS

Average Number of Students Counseled Per Week	Individual Counseling						Group Counseling					
	Full-time Counselors			Part-time Counselors			Full-time Counselors			Part-time Counselors		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Summer (1973)												
None	—	—	—	—	—	—	5.1	32	3	—	—	—
Fewer than 10	28.5	178	9	19.6	50	3	30.3	189	9	11.4	29	3
10-19	30.4	190	16	31.8	81	7	16.5	103	5	36.2	92	4
20-29	4.2	26	3	22.0	56	2	12.2	76	7	9.0	23	2
30-39	13.3	83	7	5.5	14	1	5.3	33	3	5.5	14	1
40-49	8.5	53	2	—	—	—	6.9	43	4	5.1	13	1
50-59	8.2	51	2	—	—	—	1.3	8	1	1.9	5	1
60-69	2.2	14	2	—	—	—	1.1	7	1	—	—	—
70 or more	—	—	—	—	—	—	12.8	80	6	—	—	—
Not applicable[c]	2.0	12	1	17.6	45	3	3.2	20	2	27.2	69	4
Indeterminate[d]	2.7	17	1	3.5	9	1	5.1	32	2	3.5	9	1
Total[e]	100.0	624	43	100.0	255	17	100.0	623	43	100.0	254	17
Academic Year (1973-74)												
None	3.1	9	1	—	—	—	5.3	16	2	18.3	95	3
Fewer than 10	44.3	128	11	69.4	361	17	31.6	91	11	33.3	173	8
10-19	38.4	111	10	10.4	54	6	5.2	15	1	3.8	20	2
20-29	3.5	10	1	1.5	8	1	27.2	79	5	9.4	49	4
30-39	2.1	6	1	5.8	30	2	2.8	8	1	8.1	42	4
40-49	—	—	—	—	—	—	8.7	25	1	—	—	—
50-59	—	—	—	—	—	—	8.6	25	3	—	—	—
60-69	4.5	13	2	—	—	—	8.2	24	2	3.6	19	3
70 or more	—	—	—	—	—	—	2.1	6	1	—	—	—
Not applicable[c]	—	—	—	5.0	26	2	—	—	—	9.7	51	3
Indeterminate[d]	4.1	12	1	7.9	41	4	—	—	—	14.0	73	5
Total[e]	100.0	289	27	100.0	520	32	100.0	289	27	100.0	520	32

NOTE: Table based on response to PCQ question 17 and PCQ question 25. Refer to Table 4.1 for approximate standard errors of percents; for full-time summer counselors, refer to column J; for part-time summer counselors, refer to column H; for full-time academic year counselors, refer to column G; for part-time academic year counselors, refer to column I.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Counselors who responded that they did not perform counseling during this session are included as "not applicable".

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

17.3 and 16.4 in groups. During the academic year, the median numbers of students per full-time and part-time counselor, respectively, were 10.1 and 6.3 in individual counseling, and 22.9 and 3.8 in group counseling. The heavier load in group counseling by full-time counselors during the academic year may be inflated by group meetings held at high schools.

Table 4.34 displays the percentage distributions of full-time and part-time counselors, by the average length of counseling sessions in individual and group situations, for the 1973 summer and 1973-74 academic year programs. In all cases, full-time counselors reported holding somewhat longer sessions than part-time counselors. But the average session length, compared within full-time or part-time status and within individual or group counseling, did not differ between the summer and academic year programs. Full-time counselors reported median lengths of individual counseling sessions during the summer and academic year to be 28.8 and 30.2 minutes, respectively; the analogous medians for part-time counselors were 22.4 and 21.4 minutes. The median lengths of group counseling sessions by full-time counselors for the summer and academic year were 42.0 and 39.0 minutes, respectively. The analogous session lengths for part-time counselors were 26.9 and 26.0.

Table 4.35 presents the percentage distributions of full-time and part-time counselors, by their estimates of the average number of sessions they had counseled the same UB student during the 1973 summer and 1973-74 academic years. Most full-time and part-time counselors reported that they saw a student in two to four counseling sessions during both the summer and academic year. The median numbers of sessions held with a student in the summer, by full-time and part-time counselors were 3.7 and 2.5, respectively. The analogous medians in the academic year were 3.7 and 3.9.

Because Tables 4.32 through 4.35 were based on the counselors' own estimates of their average workloads and average distribution of time on various kinds of activities, they may be subject to considerable error. But assuming that the estimates are reasonably accurate in the aggregate, they present a picture of counselors busy in other activities besides counseling (which is consistent with other results reported in this section),

Table 4.34

AVERAGE LENGTH OF COUNSELING SESSION IN INDIVIDUAL AND GROUP COUNSELING SESSIONS BY FULL-TIME AND PART-TIME COUNSELORS

Average Length of Counseling Session	Individual Counseling						Group Counseling					
	Full-time			Part-time			Full-time			Part-time		
	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]	%[a]	WN	N[b]
Summer Program (1973)												
15 min. or less	4.0	25	3	23.1	59	5	6.2	39	3	3.1	8	1
16 to 30 min.	51.2	320	21	26.3	67	5	21.3	133	9	36.6	93	6
31 to 45 min.	31.2	195	12	3.1	8	1	23.0	144	10	19.7	50	4
More than 45 min.	8.9	56	5	16.5	42	1	38.4	240	15	---	---	---
Not applicable[c]	1.9	12	1	27.4	70	4	6.4	40	4	37.0	94	5
Indeterminate[d]	2.7	17	1	3.5	9	1	4.6	29	2	3.5	9	1
Total[e]	100.0	625	43	100.0	255	17	100.0	625	43	100.0	254	17
Academic Year (1973-74)												
15 min or less	16.5	48	6	29.6	154	9	2.6	8	1	22.5	117	6
16 to 30 min.	35.2	102	12	41.5	216	11	26.5	76	9	25.9	135	7
31 to 45 min.	33.6	97	7	15.7	82	5	36.9	107	7	23.1	120	8
More than 45 min.	14.7	42	2	2.1	11	2	31.8	92	9	8.1	42	5
Not applicable[c]	---	---	---	5.6	29	2	2.3	7	1	16.4	85	4
Indeterminate[d]	---	---	---	5.6	29	3	---	---	---	4.0	21	2
Total[e]	100.0	289	27	100.0	520	32	100.0	289	27	100.0	520	32

NOTE: Table based on responses to PCQ question 17 and question 26. Refer to Table 4.1 for approximate standard errors of percents; for full-time summer counselors, refer to column J; for part-time summer counselors, refer to column H; for full-time academic year counselors, refer to column G; for part-time academic year counselors, refer to column I.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Counselors who responded that they did not perform counseling during this session are included as "not applicable".

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

Table 4.35

AVERAGE NUMBER OF COUNSELING SESSIONS HELD WITH A GIVEN UPWARD BOUND STUDENT

Average Number of Counseling Sessions	Full-time Counselors			Part-time Counselors		
	%[a]	WN	N[b]	%[a]	WN	N[b]
Summer (1973)						
One	1.2	8	1	—	—	—
Two	16.0	100	6	18.5	47	3
Three	20.9	131	8	40.1	102	5
Four	14.0	87	9	8.7	22	2
Five	13.1	82	5	3.1	8	1
Six	10.5	66	4	5.5	14	1
Seven	7.3	46	4	—	—	—
Eight or more	13.7	86	4	—	—	—
Not applicable[c]	3.3	20	2	20.5	52	4
Indeterminate[d]	—	—	—	3.5	9	1
Total[e]	100.0	626	43	100.0	254	17
Academic Year (1973-74)						
One	2.6	8	1	8.3	43	2
Two	9.7	28	3	1.5	8	1
Three	14.1	41	6	19.4	101	7
Four	36.0	104	7	18.8	98	5
Five	10.1	29	3	4.8	25	1
Six	2.0	6	1	5.4	28	2
Seven	—	—	—	—	—	—
Eight or more	25.5	74	6	32.1	167	10
Not applicable[c]	—	—	—	5.6	29	2
Indeterminate[d]	—	—	—	4.0	21	2
Total[e]	100.0	289	27	100.0	520	32

NOTE: Tabled based on responses to PCQ questions 17 and 27. Refer to Table 4.1 for approximate standard errors of percents; for full-time summer counselors, refer to column J; for part-time summer counselors, refer to column H; for full-time academic year counselors, refer to column G; for part-time academic year counselors, refer to column I.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Numbers do not include instrument nonrespondents.

[c] Counselors who responded that they did not hold counseling sessions are included as "not applicable".

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

and within their counseling function, rather harried. Full-time counselors in the 1973 summer, for example, estimated that they spent a median of somewhat less than half an hour (28 minutes) on each individual counseling session, and that they saw 16 students per week in such sessions.

V. UB PROJECT STAFF ATTITUDES TOWARD EDUCATION AND UB STUDENTS

A. Goals of Education

An item common to all staff questionnaires[23/] requested respondents to impose a weak ordering, within their philosophy of education, on 14 educational goals. These data were analyzed, after certain response imputations,[24/] and are presented in Tables 4.36 through 4.38 for project directors, instructors, and counselors, respectively. For purposes of presentation, the weak orders were grouped into three response categories--"more important" (top two categories of ordering), "moderately important" (middle category of ordering), and "less important" (lowest two categories of ordering).[25/]

The tables show that 84 percent, 61 percent, and 53 percent of the directors, instructors, and counselors, respectively, rated giving the student a solid grasp of fundamentals as being more important. Helping the student feel important as a person was rated more important by 61 percent, 77 percent, and 80 percent, respectively. Developing the student's enthusiasm for learning was also rated by the members of the three staff positions as a more important goal of education. There is agreement among the three

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[23/] Question 23 of the PDQ, question 29 of the PIQ, and question 30 of the PCQ (see Appendix D).

[24/] Responses to this item were forced into symmetric distribution such that the respondent ranked 2 items as "most important," 3 items as "more important," and 4, 3, and 2 items as "important," "less important," and "least important," respectively. Imputations involved assigning the average of omitted rankings to subitem nonresponses and forcing responses into the desired distributions, when respondents failed to follow the imposed ordering scheme. These imputations are defined in detail in Appendix E.

[25/] The labels assigned to responses are, of course, relative to the other educational goals presented and do not reflect importance in an absolute sense.

Table 4.36

UB PROJECT DIRECTORS' RATINGS OF GOALS WITHIN THEIR PHILOSOPHY OF EDUCATION

Educational Goals	More Important[a]			Moderately Important[a]			Less Important[a]		
	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]
Help student feel important	61.5	200	32	33.6	109	13	4.9	16	3
Help student learn to make choices	68.4	223	32	22.6	74	12	9.1	30	4
Develop expectations of success	56.8	185	27	26.4	86	15	16.8	55	6
Develop student's self-control	10.0	33	6	33.2	109	15	56.8	184	27
Increase student's sense of control over his environment	29.5	96	13	26.6	87	14	43.8	143	21
Develop enthusiasm for learning	77.8	253	36	11.1	36	7	11.1	36	5
Solid grasp of fundamental skills	84.4	276	40	14.0	46	7	1.6	5	1
Develop language skills (for those with non-English speaking backgrounds)	5.5	18	3	19.1	62	9	75.4	245	36
Develop student's sense of ethnic pride	14.1	46	7	46.7	153	22	39.1	127	19
Involving parents	18.6	60	8	36.7	120	20	44.7	146	20
Develop student's ability to work cooperatively with others	14.4	47	8	44.0	144	21	41.5	135	19
Develop student's respect for others	9.4	30	5	43.6	143	20	47.5	153	23
Increasing student's effectiveness in dealing with authority figures	7.7	25	2	8.7	29	5	83.5	272	41
Improving study habits	31.6	103	15	47.6	155	23	20.8	68	10

NOTE: Table based on responses to PDQ question 23. Imputations were performed on these data. On a five-point scale, more important represents 1-2.49; important represents 2.5-3.5; and less important represents 3.51-5. For approximate standard errors of percents, refer to Table 4.1, column A.

[a] There was no complete item nonresponse; thus percentages add to 100, WN add to 326 and N add to 48, within rounding error.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonrespondents.

Table 4.37

UB PROJECT INSTRUCTORS' RATINGS OF GOALS WITHIN THEIR PHILOSOPHY OF EDUCATION

Educational Goals	More Important[a]			Moderately Important[a]			Less Important[a]		
	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]
Help student feel important	77.5	2303	122	16.5	488	25	3.4	102	4
Help student learn to make choices	52.8	1570	79	28.6	849	48	16.0	475	24
Develop expectations of success	49.6	1474	76	32.0	954	49	15.6	466	25
Develop student's self-control	17.8	530	27	41.1	1221	60	38.4	1144	64
Increase student's sense of control over his environment	27.0	802	40	23.0	685	34	47.3	1408	77
Develop enthusiasm for learning	65.3	1945	104	24.4	725	34	7.6	224	13
Solid grasp of fundamental skills	60.6	1802	97	22.2	660	33	14.5	431	21
Develop language skills (for those with non-English speaking backgrounds)	8.4	249	15	29.2	866	44	59.8	1778	92
Develop student's sense of ethnic pride	20.5	610	34	31.7	942	51	45.2	1343	66
Involving parents	9.5	277	16	23.8	705	41	64.4	1912	94
Develop student's ability to work cooperatively with others	23.6	701	33	44.8	1333	68	28.0	859	50
Develop student's respect for others	23.1	688	29	39.3	1167	65	35.0	1039	57
Increasing student's effectiveness in dealing with authority figures	11.5	342	17	19.1	568	28	66.7	1984	106
Improving study habits	27.1	808	48	39.1	1164	60	31.0	923	43

NOTE: Table based on responses to PIQ question 29. Imputations were performed on these data. On a five-point scale, more important represents 1-2.49; important represents 2.50-3.50; and less important represents 3.51-5.0. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] There were three complete item nonresponses; thus percentages add to 97, WN add to 2894 and N add to 151, within rounding error.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonrespondents.

Table 4.38

UB PROJECT COUNSELORS' RATINGS OF GOALS WITHIN THEIR PHILOSOPHY OF EDUCATION

Educational Goals	More Important[a]			Moderately Important[a]			Less Important[a]		
	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]
Help student feel important	80.0	948	66	12.6	150	9	5.5	64	7
Help student learn to make choices	54.1	641	54	28.1	334	18	15.9	189	10
Develop expectations of success	49.5	588	44	36.4	432	25	12.2	144	13
Develop student's self-control	12.5	148	13	28.5	337	28	57.1	677	41
Increase student's sense of control over his environment	26.1	309	23	21.6	257	19	50.4	597	40
Develop enthusiasm for learning	68.1	807	55	22.7	269	18	7.4	87	9
Solid grasp of fundamental skills	53.3	631	49	29.5	351	20	15.4	181	13
Develop language skills (for those with non-English speaking backgrounds)	10.7	127	7	24.7	292	21	62.8	742	54
Develop student's sense of ethnic pride	25.0	298	17	26.1	309	22	47.1	557	43
Involving parents	10.9	129	13	25.0	296	25	62.3	738	44
Develop student's ability to work cooperatively with others	28.7	341	20	45.1	533	40	24.3	289	22
Develop student's respect for others	29.3	346	22	30.5	361	28	38.5	455	32
Increasing student's effectiveness in dealing with authority figures	10.8	128	9	27.0	321	20	60.4	715	53
Improving study habits	27.7	328	19	47.8	567	44	22.7	261	19

NOTE: Table based on responses to PCQ question 30. Imputations were performed on these data. On a five-point scale, more important represents 1-2.49; important represents 2.50-3.50; and less important represents 3.51-5.0. For approximate standard errors of percents, refer to Table 4.1, column K.

[a] There were two complete item nonresponses; thus percentages add to 93, WN add to 1163, and N add to 82, within rounding error.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonresponse.

staff categories that increasing the student's effectiveness in dealing with authority figures was not too important. Only 8 percent of the directors, and 11 percent of the instructors and counselors rated this goal as more important. Clearly, the tables indicate an extremely high degree of agreement and similarity in the staff members' aggregate ratings of the goals.

To measure the relation among the three rankings of the 14 goals of education, the median of the weak orderings were used to describe the aggregate order of importance of the goals within each staff category.[26/] The medians were then ranked from lowest to highest. Table 4.39 presents the ranked median orderings of goals of education by the project staff. When three sets of rankings are obtained, one may determine the association among them by using the Kendall coefficient of concordance.[27/] As a technique designed to determine the agreement among several judges or the association among several variables, it provides a measure of association based upon rankings. Kendall's coefficient of concordance for the three rankings given in Table 4.39 is .90, and a coefficient of this magnitude would occur by chance less than 1 time in 1,000 if, in fact, there was no relationship. Such strong agreement among the project directors, instructors, and counselors concerning goals of education suggests that UB staff members were similarly directed concerning program goals.

Although the data presented reflects on national agreement among staff categories, the same strong agreement among staff as to program mission was observed at the project level during site visitations. Generally, staff members agreed that the more important goals of education were developing the student's enthusiasm for learning, helping students to feel important, and providing students with a solid grasp of fundamental skills.

[26/] The median is that value in the range of ordered responses to a variable such that 50 percent of the respones are greater than the median and 50 percent are smaller. The medians in this case were obtained by assigning the values of 1 through 5 to the 5 original "importance" categories, from "most important" to "least important."

[27/] A brief discussion of the Kendall coefficient of concordance is available in Appendix G. More detailed descriptions can be obtained from any introductory text on nonparametric statistics. See, for example, S. Siegal, Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.

Table 4.39

RANKED MEDIAN ORDERING OF THE UB PROJECT STAFFS' RATINGS OF GOALS WITHIN THEIR PHILOSOPHY OF EDUCATION

Educational Goals	Rank Order of Importance[a/]		
	Project Director	Project Instructor	Project Counselor
Help student feel important	2.5	1.0	1.0
Help student learn to make choices	4.0	3.5	3.5
Develop expectations of success	5.0	3.5	5.0
Develop student's self-control	12.0	8.0	12.5
Increase student's sense of control over his environment	9.5	11.0	10.0
Develop enthusiasm for learning	2.5	3.5	2.0
Solid grasp of fundamental skills	1.0	3.5	3.5
Develop language skills (for those with non-English speaking backgrounds)	13.5	13.0	12.5
Develop student's sense of ethnic pride	9.5	8.0	7.5
Involving parents	9.5	13.0	12.5
Develop student's ability to work cooperatively with others	9.5	8.0	7.5
Develop student's respect for others	7.0	8.0	7.5
Increasing student's effectiveness in dealing with authority figures	13.5	13.0	12.5
Improving study habits	6.0	8.0	7.5

NOTE: The ranked median orderings are based on ranking the medians of the responses to PDQ question 23, PIQ question 29, and PCQ question 30.

[a/] The ranks given are the ranked medians of ratings assigned within staff category. Data were weighted prior to median computations and medians were rounded prior to ranking.

B. Perception of UB Students

An item in each staff questionnaire[28] requested respondents to rate the UB students in their project along several dimensions. The results are presented in Tables 4.40 through 4.42. Only students' peer relations and student creativity were rated good to excellent by more than half of the project directors, instructors, and counselors. Although there was variation among the various staff categories, project participants were seen as being good to excellent in general academic ability by from about one-fourth to one-third of the staff members. Student attitudes toward school and toward authority were generally seen as being only poor to fair, though slightly more average in the eyes of instructors. (The instructors may have had a more realistic reference point for such ratings as a result of teaching other students in either the high school or college.)

To examine the relationship among ratings by the three staff categories, the median ratings were determined and ranked to describe the order of the ratings of students along different attribute dimensions.[29] Table 4.43 presents the ranked median ratings of students for each staff category. Kendall's rank correlation coefficient (tau) provides a measure of the degree of association or correlation between two sets of ranks.[30] The Kendall tau value was .71 for rankings by directors and instructors, .60 for directors and counselors, and .90 for instructors and counselors. None of these described relationships would occur by chance more than 5 times in 1,000 if, in fact, no relationship existed.

Project directors, instructors, and counselors strongly agree in the order of aggregate ratings of the several attributes of UB students. It can be seen from Table 4.43 that all three staff categories perceived the students to be most proficient in peer relations and creativity, and

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[28] Item 34 of the PDQ, item 35 of the PIQ, and item 34 of the PCQ (see Appendix D).

[29] The medians were based on a scale of 1 (for "poor") to 5 (for "excellent").

[30] Because the student attribute of "responsibility" was omitted from the instructor's questionnaire, a coefficient of concordance was not calculable. A brief discussion of Kendall's tau is given in Appendix G. More detailed discussion can be obtained in introductory texts on nonparametric statistics. See, for example, S. Siegal, Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.

Table 4.40

UB PROJECT DIRECTORS' RATINGS OF STUDENTS IN THEIR PROJECTS

Student Attributes	Excellent-Good			Average			Fair-Poor			Indeterminate[a]		
	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]
General academic ability	24.2	79	11	41.1	134	19	33.1	108	17	1.7	5	1
Motivation	37.7	123	18	18.9	62	9	41.8	136	20	1.7	5	1
Attention span	19.9	63	10	37.9	124	17	39.3	128	19	3.5	11	2
Creativity	51.7	168	26	29.3	95	13	15.6	50	7	3.5	11	2
Responsibility	26.9	88	14	34.1	111	17	37.3	121	16	1.7	5	1
Self-concept	19.3	63	9	26.8	87	12	52.3	170	26	1.7	5	1
Independence	18.2	59	9	34.4	112	15	39.2	127	20	8.3	27	4
Peer relations	60.1	196	29	22.4	73	12	13.0	42	5	4.6	14	2
Nonpeer relations	19.7	64	10	30.1	98	15	43.8	142	20	6.5	20	3
Attitude toward school	12.5	40	7	25.0	82	9	58.0	189	30	4.6	14	2
Attitude toward authority	14.3	47	8	23.1	75	10	58.1	189	28	4.6	14	2
Attitude toward life	30.3	99	15	24.9	81	11	38.4	126	19	6.3	20	3

NOTE: Table based on responses to PDQ question 34. Totals: percentages add to 100, WN add to 326, and N add to 48, within rounding error. For approximate standard errors of percents, refer to Table 4.1, column A.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[c] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[d] Numbers do not include instrument nonrespondents.

Table 4.41

UB PROJECT INSTRUCTORS' RATINGS OF STUDENTS IN THEIR PROJECTS

Student Attribute	Excellent-Good			Average			Fair-Poor			Indeterminate[a]		
	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]	%[b]	WN	N[c]
General academic ability	35.6	1058	55	32.7	974	49	23.7	706	37	7.9	237	13
Motivation	32.7	972	49	32.7	971	46	29.0	860	50	5.7	170	9
Attention span	29.2	868	45	29.6	879	45	35.1	1044	55	6.1	182	9
Creativity	51.5	1530	77	23.8	709	40	15.9	473	23	8.8	261	14
Self-concept	29.0	862	42	33.8	1004	49	29.9	889	51	7.4	219	12
Independence	35.2	1045	49	28.7	854	43	28.1	835	49	8.1	240	13
Peer relations	62.2	1848	92	25.8	768	41	7.4	220	13	4.6	137	8
Nonpeer relations	34.7	1031	51	35.2	1046	53	19.1	569	32	11.0	327	18
Attitude toward school	25.6	760	35	32.9	980	55	35.0	1041	53	6.4	191	11
Attitude toward authority	28.5	846	44	35.6	1057	56	29.8	884	43	6.2	185	11
Attitude toward life	38.2	1137	54	27.6	821	45	21.4	635	33	12.8	380	22

NOTE: Table based on responses to PIQ question 35. Totals: percentages add to 100, WN add to 2973, and N add to 154, within rounding error. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[b] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] Numbers do not include instrument nonrespondents.

Table 4.42

UB PROJECT COUNSELORS' RATINGS OF STUDENTS IN THEIR PROJECTS

	Excellent-Good			Average			Fair-Poor			Indeterminate a/		
Student Attributes	%b/	WN	Nc/	%b/	WN	Nc/	%b/	WN	Nc/	%b/	WN	Nc/
General academic ability	27.3	323	15	41.4	491	41	29.3	348	26	1.9	23	2
Motivation	43.2	512	32	15.0	177	17	41.8	495	35	0.0	--	--
Attention span	19.0	225	15	30.8	365	26	47.1	557	40	3.1	37	3
Creativity	60.9	721	44	25.4	300	24	12.4	147	15	1.4	17	1
Responsibility	32.8	389	29	42.8	389	29	24.3	288	28	0.0	--	--
Self-concept	30.8	365	23	25.4	301	22	43.3	513	38	0.5	6	1
Independence	46.0	544	37	30.2	358	19	19.2	227	24	4.6	54	4
Peer relations	71.9	851	56	15.5	184	15	11.1	132	12	1.4	17	1
Nonpeer relations	40.5	481	32	34.0	403	25	20.3	240	21	5.1	62	6
Attitude toward school	26.9	318	22	20.1	238	19	50.8	602	41	2.3	27	2
Attitude toward authority	28.0	331	23	27.2	322	23	42.0	498	35	2.8	34	3
Attitude toward life	44.3	525	31	28.7	339	24	21.3	251	23	5.8	69	6

NOTE: Table based on responses to PCQ question 34. Totals: percentages add to 100, WN add to 1184, and N add to 84, within rounding error. For approximate standard errors of percents, refer to Table 4.1, column K.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

c/ Numbers do not include instrument nonrespondents.

Table 4.43

RANKED MEDIAN UB STAFF RATINGS OF STUDENTS ON SEVERAL DIMENSIONS

Student Attribute	Rank Order of Quality[a]		
	Project Directors	Project Instructors	Project Counselors
General academic ability	3.5	4.5	7.5
Motivation	3.5	6.5	7.5
Attention span	7.5	10.5	11.0
Creativity	2.0	2.0	2.0
Responsibility	5.5	b/	6.0
Self concept	10.0	8.5	9.0
Independence	7.5	6.5	3.5
Peer relations	1.0	1.0	1.0
Nonpeer relations	9.0	4.5	5.0
Attitude toward school	12.0	10.5	12.0
Attitude toward authority	11.0	8.5	10.0
Attitude toward life	5.5	3.0	3.5

NOTE: The median rank orderings are based on ranking the medians of responses to PDQ question 34, PIQ question 35, and PCQ question 34.

a/ The ranks given are the ranked medians of ratings assigned within staff category. Data were weighted prior to median computation. Medians were rounded prior to ranking and were computed only for determinate responses, with no adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, or inconsistent responses).

b/ This dimension was not rated by instructors.

student general academic ability was rated around average by all staff categories. Student attitudes toward authority and toward school were seen by project directors, instructors, and counselors as ranking lowest, but student attitude toward life was ranked high. All three types of staff also perceived the students' self-concepts to be relatively poor. It is interesting that the students, as perceived by the staff, showed positive outlooks toward life, but negative attitudes toward school and authority, yet the staff also seemed to agree that increasing student effectiveness in dealing with authority figures (Tables 4.36 through 4.39) was of relatively low importance, as compared to other educational goals.

C. Instructors' Perceptions of the Importance of Several Aspects of Instruction

Table 4.44 shows how instructors perceived the importance of different aspects of teaching as determined from a question requesting them to impose a weak ordering of the relative importance of fifteen aspects of their teaching. For the purpose of presentation, the weak orders have been grouped into three response categories: "more important," "moderately important," and "less important."[31] The table shows that encouraging the students to become involved was rated more important by 60 percent of the project instructors. Both giving students praise and affection and answering students' questions were seen by more than 50 percent of the instructors as being more important. Perceived as less important by project instructors were the use of disciplinary measures to discourage inappropriate behavior (82 percent), and using rewards to shape behavior (69 percent). Also seen as not very important were establishing a clear time structure and working with parents (rated more important by only 6 and 4 percent of the instructors, respectively).

Generally, project instructors viewed such aspects of teaching as encouraging the students to become involved, talking with students, and encouraging the students to make choices as being of most importance in

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[31] The groupings were obtained in a manner analogous to that used with staff members' ordering of educational goals, which has been described in subsection A.

Table 4.44

UB PROJECT INSTRUCTORS' RATINGS OF THE IMPORTANCE OF THE THINGS THEY DO IN TEACHING

Aspect of Teaching	More Important[a]			Moderately Important			Less Important[b]			Indeterminate[c]		
	%[d]	WN	N[e]	%[d]	WN	N[e]	%[d]	WN	N[e]	%[d]	WN	N[e]
Presenting structured materials	21.4	636	33	33.1	985	47	37.1	1103	60	8.4	250	14
Using rewards to shape behavior	8.8	263	15	13.6	404	24	68.7	2042	102	8.9	264	13
Preparing instructional materials	22.7	676	39	38.7	1150	56	30.2	899	46	8.4	249	13
Preparing a classroom environment	45.8	1360	71	32.2	957	51	15.9	471	21	6.2	185	11
Encouraging students to become involved	60.2	1791	95	27.3	812	39	4.8	144	9	7.6	227	11
Encouraging students to make choices	47.6	1416	73	30.9	917	52	14.2	420	17	7.4	220	12
Answering students' questions	57.7	1715	90	31.3	931	45	5.4	161	10	5.6	167	9
Diagnosing individual learning problems	47.2	1403	75	36.5	1086	56	11.0	327	14	5.3	158	9
Using disciplinary measures	3.0	88	5	5.3	157	10	81.9	2434	125	9.9	293	14
Talking with students	47.4	1410	71	40.1	1192	64	6.7	200	9	5.8	172	10
Encouraging students to concerntrate on task	29.3	869	42	44.9	1335	70	16.6	494	28	9.3	275	14
Giving students praise and affection	59.3	1764	87	27.4	813	44	8.1	242	14	5.2	154	9
Working with parents	4.1	123	6	22.7	675	37	65.1	1938	100	8.0	237	11
Encouraging groups of students to work together	17.3	517	23	50.2	1493	80	22.1	657	36	10.4	308	15
Establishing a clear time structure	5.6	167	9	19.9	592	28	65.8	1956	105	8.7	258	12

NOTE: Table based on responses to PIQ question 30. Totals: percentages add to 100, WN add to 2973, and N add to 154, within rounding error. For approximate standard errors of percents, refer to Table 4.1, column F.

[a] More important includes categories most important and more important.

[b] Less important includes categories least important and less important.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[e] Numbers do not include instrument nonrespondents.

their teaching. The instructors viewed their instructional activities in the same light as they viewed educational goals. For example, as seen earlier in Table 4.37, 77 percent of the instructors perceived helping the student feel important as being more important, and 53 percent thought that helping the student to learn to make choices was more important. Thus, the educational philosophy of the instructors (which is very similar to that of other staff members) appears to be congruent with their ideas of the important aspects of instruction in the UB program.

VI. SUMMARY

This chapter has examined a large number of attributes of the staff members of regular UB projects (excluding veteran and demonstration projects) in coterminous United States during program year 1973-74. The national estimates of the characteristics and activities of staff members, were based on data gathered in survey questionnaires, which for the most part, were not verified with other data sources. Major topics addressed in this chapter were the demographic and background characteristics of the UB project directors, instructors, and counselors, their training and experience, their UB activities, and their attitudes toward educational programs and their students. A table of generalized standard errors was provided to aid in interpretation of questionnaire results, and impressions gained during site visitation were used to augment and aid in interpretation of the tabular data.

Although project directors as a group were slightly older than instructors and counselors, most staff members were young (age 35 or less). Nearly all project directors were male, while over half of the instructors and counselors were also male. The greatest proportion of project directors were black (47 percent), while the greatest proportions of instructors and counselors were white (55 and 42 percent, respectively). These ethnic and sex representations are not proportional to the ethnicity representation of UB students, who are predominantly black (by about 60 percent) and female (about 55 percent).

Most staff members reported having lived in cities during their youth (through the high school years), and even more reported residing in cities for most of their lives since high school. The staff reported their parents as being moderately well educated, their fathers as being predominately laborers or service workers, and their mothers as being primarily homemakers, laborers, or service workers. A sizable minority of fathers and mothers, however, were reported to hold professional or managerial positions. Since a staff member with a background similar to the population of students served has the potential for a better understanding of those students, there are arguments for a better matching of staff and student background.

In general, all three types of UB staff were found to be well trained, with considerable experience in their professional fields, but with less previous experience in working with disadvantaged students. Among project directors, 75 percent reported having obtained an advanced college degree, as did 68 percent of the instructors and 48 percent of the counselors. About a third of the members within each of the three staff categories reported that they were enrolled in continuing formal education at the time of the survey. Academic course work on the part of instructors and counselors was in their professional area. Reported results also indicated that UB staff members had gained a good deal of practical experience in their professional field; however, in the majority of cases, their experience in working with disadvantaged students had been gained primarily as a result of their work with the UB program.

Over half of the instructors and counselors were employed full-time by UB during the 1973 summer, whereas less than a quarter were employed full-time during the 1973-74 academic year. At the time of the survey (spring 1974), a large proportion of those not employed full-time by UB were otherwise employed, primarily in teaching and helping professions. The staff reported heavy workloads which included a number of diverse functions. Some of the functions, especially teaching and counseling, were shared by all three types of staff. Some staff members saw the allocation of their time among various activities to be quite discrepant from what they should ideally be doing. There was no consistent trend, however, for any of the three staff groups to report that they were allocating more or less time than desired to any of a number of specified functions, and about two-thirds of the staff saw their time actually allocated in ways that were within 10 percent of what they thought would be ideal.

Both full-time and part-time instructors reported teaching from two to three classes, on the average, during both the summer and academic year program. This lack of differentiation in class load for full- and part-time instructors is probably a reflection of the diversity of tasks that instructors reported. Consistent with UB program philosophy, most instructors used individualized instructional methods, taught in open classrooms, and did not use competitive grading systems; however, the instructors did rely heavily on some of the more traditional methods.

Counselors reported a fairly heavy counseling workload on the average. Full-time counselors reported counseling slightly fewer than 20 students per week in the summer and slightly more than 10 students per week in the academic year, in individual sessions alone. In group sessions, full-time counselors saw, on the average, about 20 students per week in the summer and about 25 per week during the academic year. Part-time counselors reported somewhat lighter loads. The area of counseling to which both full- and part-time counselors devoted the greatest percent of their time during both summer and academic year programs was four-year college entry.

Among the three staff categories, staff members were in agreement concerning educational philosophy, agreeing that developing students' feeling of importance, enthusiasm for learning, and fundamental skills were the most important educational goals. The staff members were also in agreement in their views of the UB students, rating them highest in peer relations and creativity, and lowest in self concept and their attitudes toward school and authority. It is interesting to note that while the staff rated UB students as poorest in terms of their attitudes toward school and authority, they also reported that the goal of improving the students' attitude toward authority as one of their least important educational goals.

Chapter 5

Characteristics of Upward Bound Projects

I. GENERAL

The purpose of Chapter 5 is to describe the structure and function of UB projects in the coterminous United States in program year 1973-74. The unit of analysis is the project, rather than individual staff members. In the previous chapter, characteristics of staff members were described, based on individual members' responses, but, in the present chapter, characteristics of projects, as represented by responses of staff members within each project, will be described. To create the required project units of analysis, responses of counselors from a given project were averaged to form one value for all counselors in that project. Answers of instructors in a project were similarly treated to yield one mean value.[1] Because each project had only one director, no such aggregation was necessary.

In this chapter, more than any other, impressions from site visits will be presented. While the questionnaire data can stand alone, interviews conducted and observations made during site visitations provided data which directly relate to project structure and function and which may be used to provide insights not possible from the responses to the structured questionnaire items. Certain aspects of project operation and certain unique practices had not been anticipated during instrumentation, and were, therefore, not covered by the questionnaires. Other aspects of project operation which had been anticipated were not covered in the staff instruments in the interest of maintaining instruments of manageable size.

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[1] Since sampling weights were identical for all the counselors within a project, weighted and unweighted means yield the same value. The weights for all instructors in a project were also identical. The use of a measure of dispersion, in addition to the average response, was anticipated to investigate a different set of questions, to study the extent to which instructors or counselors in the same project varied in their answers to the same questions, as measured across all projects. In projects where only one instructor or counselor responded to an item, there was no variability. Hence, a measure of within project variability could be computed only for projects with at least two respondents of the same staff category to an item. Because only about half of the projects had more than one responding counselor, a measure of within project variability was not available for a sufficient number of projects. Such a measure was computed for instructors and analysis was undertaken, but did not reveal any noteworthy patterns. Hence these results are not presented.

Nonetheless, these aspects of the UB program were observed in the UB programs that were visited, and they will be reported to give a flavor to the program description which is not possible from the questionnaire responses alone. It may be argued successfully that the information gained during site visits provides an unrepresentative picture of the program, since with such a small sample size (15 projects) it is most unlikely that the visited projects are representative of the population. It should be pointed out, however, that questionnaire results also reflect a bias, namely the bias of variable selection which was introduced during questionnaire development. The items included in the various staff questionnaires reflected what the RTI staff had determined *á priori* to be the important aspects in describing program structure and operation. During the site visits, the importance of most of these aspects was verified, but it also became evident that some other unmeasured aspects were equally or more important. The mix of results presented in this chapter is therefore seen as a healthy one, but to avoid reader confusion, site visit results will be clearly stated as such, when cited.

The generalized standard errors to be used for most of the questionnaire results reported in this chapter and an example of how to use them are given in Table 5.1. The standard errors for project directors' responses are the same as those found in Table 4.1, but for reader convenience, they are reproduced here.

II. OVERVIEW OF PROJECT OPERATION

Prior to presentation of questionnaire data, an overall picture of project operation will be presented for the reader who may not be familiar with all aspects of the program as implemented at the project level. This overview is drawn exclusively from the site visit observations and unstructured interviews with project staff and students during those visits, but it is compatible with questionnaire data collected in this study and with information routinely maintained by USOE.

Table 5.1

APPROXIMATE STANDARD ERRORS OF ESTIMATED PERCENTAGES FOR CHAPTER 5

Row	Estimated Percentage	Estimated Standard Error (in percentage points)		
		A (Directors)	B (Instructors)	C (Counselors)
1	5 or 95	2.3	3.0	3.2
2	10 or 90	3.9	4.2	4.4
3	15 or 85	5.2	5.0	5.3
4	20 or 80	6.0	5.6	5.9
5	25 or 75	6.6	6.0	6.4
6	30 or 70	7.1	6.4	6.8
7	35 or 65	7.4	6.7	7.1
8	40 or 60	7.7	6.8	7.2
9	45 or 55	7.8	6.9	7.4
0	50	7.8	7.0	7.4

NOTE: This table contains estimates of approximate standard errors applicable to the majority of estimated percentages contained in Chapter 5. This table was constructed to provide a general order of magnitude of the sampling errors of estimated percentages, and is based on the results of a number of different sampling error calculations. The formulas and procedures used in these calculations are detailed in Appendix B.

To use the table to determine the approximate sampling error for an estimated percentage one must first identify the appropriate row and column to use. Select the row that most nearly corresponds to the value of the estimated percentage. Row 1 would be used for estimated percentages near 5 or 95 percent, row 2 for estimated percentages for 10 or 90 percent, etc. Then select the applicable column:

Column A for Directors
Column B for Instructors
Column C for Counselors.

For example, to determine the approximate standard error of an estimated 17.7 percent found in Table 5.2 one would first identify row 4 as the appropriate row. Row 4 is selected because 17.7 percent is closer to the 20 percent of row 4 than it is to any of the other percentages listed. Column A is selected as the appropriate column, since Table 5.2 is based on project director responses. Using row 4 and column A the approximate standard error is found to be 6.0 percentage points.

It should be noted at the outset that no clear picture emerged during site visits (or from the questionnaire data) of a "typical" project beyond several general procedures and services. The visited projects were characterized by common purposes and basic activities which serve to define UB in a general way. But they were also characterized by notable differences in specific program operations, perhaps more different in the academic-year component than in the summer portion. There were also distinct differences among the 15 visited projects in basic philosophy and thrust, sometimes the result of longstanding practice and sometimes related to different requirements in the various USOE regions. Similarly, there were different degrees of adherence to the official guidelines governing program operations. It became quite clear that all projects do not function in the same way. This observation is important in its own right, and also because it means that operationally UB does not represent a single intervention treatment. In fact, it cannot easily be viewed as two or three clearly defined treatments, with respect to either the nature of the actual program or the population served.

Given the legislative description of UB purposes ("designed to generate skills and motivation necessary for success in education beyond high school") and the Guideline's provisions (that the project "must include a curriculum designed to develop positive attitudes toward learning, creative thinking, effective expression" and that "UB is a precollege preparatory program"), it should not have been surprising that actual operations and emphases, as well as underlying philosophies, varied somewhat by project. The regulations governing UB also present a general statement which can be interpreted in many programatic ways: "projects ...[should] have promise of motivating and preparing academic risk students from low-income backgrounds and with inadequate secondary school preparation to engage successfully in programs of postsecondary and higher education."

Among the 15 projects visited, various emphases and guiding purposes emerged, which had a direct bearing on actual program operations. For some projects the basic purpose was "to keep students in high school" with a concomitant emphasis on basic and remedial learning skills. In others, the fundamental purpose was to provide self-confidence and "tutoring as needed."

In one such project the director stated that it was not possible to teach much in the way of academics in six weeks; thus, little attempt was made to do so. Still other projects emphasized, to varying degrees, academic survival in postsecondary placements, and thus attempted to implement "no-nonsense" programs of academic work and exposure, especially in the summer.

Indeed, most projects directed their year-round efforts to the development of motivation, awareness, skills, and confidence as related to potential postsecondary placements, and in this sense there was considerable commonality. However, for projects with younger students (grades 8-10), it was not always feasible to direct the program toward distant postsecondary enrollment, and other emphases prevailed.

Another area of variation involved the kind of postsecondary placement emphasized by the projects. Some projects clearly emphasized, and in fact virtually required, applications to and placement in 4-year colleges and universities. Other projects limited their sights almost exclusively to 2-year community colleges (in most instances this was related to the nature of the host institution). The majority of visited projects appeared to be open to encouraging placement in any sort of postsecondary facility, including technical institutes and short-term practical training.

Another example of philosophic variation related to the self-direction expected of students in the summer program. In six projects, students were clearly expected to seek out the help they needed, to look for the tutors, to arrange appointments, etc.; there was no organized time or place for extra-class assistance. Other projects allowed no room for doubt about study and tutoring; they required study hours, required specific tutoring and review, and otherwise did not leave this matter up to students. The position was held that given the nature of the population and their slow groping toward maturity, it was necessary to "cover all angles" in order to assure a beneficial academic experience.

There was similar related variation across projects with respect to control of the students' time in the summer program, and staff awareness of student whereabouts, activities, fulfillment of obligations, class attendance, and so on. In most instances this variation was related to a philosophic stance concerning development of student independence and responsibility. In some projects, summer staff roles included assignment to oversee a group of students directly or indirectly, at all times; but in most visited projects, the supervision was less rigorous and reflected an assumption about student self-management regardless of the ages involved.

An attempt is made in the remainder of this section to characterize some of the common features of the visited projects. In the presentation, some of the observed variability in project operation will be specified. A documentation of the complete extent of project diversity would, however, require a considerably longer discourse than that presented here.

A. The Academic Year Program

The academic year program was characterized by weekly or monthly staff contact with students for tutoring or other purposes, and a relationship with feeder high schools which involved a counselor in the school serving as "contact counselor" for the UB students. Among the 15 projects, all but two had such contact counselors (although not necessarily one at each feeder high school) whose jobs were to stay in touch with students, in some cases to arrange for or provide tutoring, and to relay student needs to UB staff.

The academic year program appeared to be a function of the number and kind of staff available as well as of project philosophy and purpose. The majority of visited projects maintained a skeletal staff (project director, secretary, and full- or part-time counselor) during the academic year, while others had work-study tutors or part-time instructors in addition to the basic staff. At the more heavily manned projects, there was an emphasis on weekly contact which involved counseling, work with college applications, and various sorts of tutoring. In four projects, though, formal evening or Saturday classes were held, for which students preregistered and had fairly regular responsibilities. One UB project had a very wide range of offerings (including two math courses, psychology, vocabulary, local government, career choices, history, and English composition) for about 100 students. When these weekly offerings (plus counseling, work on college and financial aid applications, and tutoring) at one project are contrasted with another location where there were four "tutoring weekends" per year, it can be seen that UB did not constitute nearly the same sort of assistance or amount of contact across projects.

Formal academic year contact of students with the UB staff varied from four times per year to 2-4 hours per week. These contacts occurred on the sponsoring campus, at the high schools, or at both high school and campus. In one visited project, the contact counselor was in regular touch with students at the high school, but UB staff saw them formally only five times per year to deal with the postsecondary application process; however, in most instances where the contact counselor maintained regular touch with students, there was also regular contact with UB staff. Regardless of the persons involved, it can be seen that academic year contact, though regular in most projects, was brief. It may have provided a sense of community for students or given them a means for getting help when it was needed, but it did not always amount to a sustained program of services or activities.

In addition to formal and informal tutoring, general counseling, and classes, visited projects also engaged to varying degrees in academic counseling, recreation, vocational and career advising, and occasional cultural activities. A few also arranged trips to college campuses for concerted exposure to campus life and realities, while for others this was reportedly not possible because of lack of funds. With respect to postsecondary applications, most projects required that seniors apply to a stated number of institutions (usually three, sometimes two or even five), often but not always including the host institution. Understandably, these applications and all the associated requirements took up a good deal of the contact time during the academic year program, and represented a most important element of UB services.

While projects maintain limited contact with students during the academic year, there is a considerable amount of activity behind the scenes. During this period, as much effort appears to go into these additional processes as into the direct instructional or counseling work with students. Based upon visits during the academic year and summer interviews, most projects engaged extensively in a variety of important activities which included: (1) preparation of the major UB thrust, the summer program, typically involving extensive planning, logistical arrangements, and communication; (2) contact with postsecondary institutions regarding admissions, admissions policies, placement, test and other requirements, and financial aid; (3) plans for campus visits and other cultural activities; (4) communications with feeder high schools concerning designation of contact counselor, recruitment strategies, student needs, tutoring plans, possible course credits, staff involvement in the summer program, etc.; (5) intake procedures with new prospects (applications, parent forms, interviews, medical forms, school recommendations, etc.); (6) arrangements for career speakers or college visitors; (7) preparation of the project application and associated communications with the host institution and the regional USOE office; (8) preparation of standard reports; and (9) contacts with parents and with advisory groups.

B. The Summer UB Program

The characteristic summer experience was a 6-week oncampus program which included formal courses, recreation, cultural activities, tutoring, and other opportunities for personal development. At all 15 visited projects, students lived in the campus dormitories. Most of these projects offered a variety of courses (usually one to two hours long) and required registration in three or four of them. Often, one of the offerings was "guidance and counseling" which typically covered career and academic counseling and, for rising seniors, represented the first consistent touch with the postsecondary application process. Aside from the typical emphasis on mathematics, composition, history, personal communication, literature, and reading skill (there was very little opportunity for work in science or foreign language), there were usually electives in the arts, certain sports, drama, and creative crafts.

Some of the visited projects held these classes, electives, and other activities on a regular basis, five days a week, but most projects held classes only four days a week, usually reserving the fifth day for tutoring, counseling, and special activities (cultural, recreational, or travel). The activities were well attended but tutoring was not required or checked for some classes.

Different criteria existed for student selection of formal classes and the extent to which students were required to take them. In four projects, students were required to take "what they need," which usually meant math, reading, and/or English. Three projects gave completely free choice to students, four steered selection in terms of high school courses the following year, one arranged classes almost exclusively to make up for past failures, and the remainder employed some combination of these methods.

Some projects reported that all feeder schools allowed high school course credits to UB students for their UB course work, while others reported this was the case with only some high schools. In both instances, credit was usually allowed only for summer work, although certain high schools considered only combined summer and academic year work in the same subject. About half the visited projects stated that feeder schools did not allow such credits.

With regard to summer program structure and supervision, there was also considerable variation among the site-visit projects, amounting to three levels of thoroughness as observed. Five of the projects had what appeared to be highly programed and supervised summer experiences, with virtually every minute planned for academic, recreational, and personal involvements. All included formal evening study and tutoring up to 9:00 or 10:00 p.m., and one required that this be done in the program building and not in the dorms. Project staff spoke of having learned from experience to engage in considerable planning and to involve students at all times, under supervision. Another six projects had less structured programs, but nonetheless carried on fairly thorough supervision. Students were relatively free to move about the campus, and especially on the "offday" were pretty much on their own. Most of these projects included evening study in their schedules. The final set of four projects were rather unstructured about both program and supervision (not requiring and/or not checking class attendance, for example) and provided little evidence of a carefully planned multifaceted exposure of students to the world about them.

C. Bridge Component of Summer Program

The project is directed by the Program Guidelines to provide means for further developing skills and motivation, the opportunity to take college-level courses, and the possibility of earning college credit. For this reason, summer programs include special provisions for those who have graduated from high school and are about to enter postsecondary institutions (the Bridge Program). For a variety of reasons, there were widely different practices among the 15 projects visited. Several projects had no Bridge component, including some with otherwise eligible students, and there were other cases of special situations. In one case, the project arranged for all rising seniors either to go to another institution for further exposure to a postsecondary environment or to get a job.

Though not bearing directly on the nature of Bridge component, it may be noted that many eligible students do not participate in the summer program at all. A few of these represent UB dropouts, but most are those who must work in the summer either for immediate reasons or for purposes of fall registration in postsecondary facilities. A few projects encouraged some students to work, and one insisted that each student earn and save $400 and encouraged them to take concurrently a summer course or two at a high school or community college.

Where college courses with potential for credit were offered, college or university staff taught the classes and there was a fairly strong likelihood that attendance was checked and participation was more stringently required. A number of such classes were observed. It appeared that most students kept up pretty well, though this appeared to be related to the amount of tutoring assistance available as well as the instructor's understanding of the group and its needs. Although it was not necessarily the case that students received credit, they had to pass the course. There appeared to be as many instances in which the classes were composed exclusively of UB students as those in which UB students were in classes with regular college summer students. Both of these conditions obtained within certain projects.

D. Other Program Functions

Most of the functions of the UB projects have been covered in the brief characterization given above or will be covered subsequently in this chapter. Two relatively important functions were not adequately addressed in the questionnaires and can be examined only through the site visit findings. These functions, recruitment and selection of students and followup of practices for participants placed in postsecondary institutions, will be briefly examined in this subsection.

1. Recruitment and Selection of Students

The federal regulations and the DSA Guidelines define the UB population as students in the "low family income" range (as defined by the Commissioner of Education) whose achievement in high school is such that they are not likely to apply to or be accepted at postsecondary institutions. The latter is sometimes labeled as "academic risk for college." Project staff are asked to consider grades, test scores, school recommendations, and intuition in selecting students on the academic risk criterion.

Recruitment for the 15 programs visited occurred in anywhere from 2 to 22 feeder high schools, with recruitment, in essence, accomplished by school personnel while selection was the responsibility of the UB project director and counselor. There appeared to be only a weak positive relationship between number of schools and number of students in the program. The Guidelines suggest the importance of recruiting from a small number of schools in order to have a sizable cluster at each school, but local situations and preferences also entered the picture. For example, two projects reported purposeful recruitment of small numbers at many schools; and some projects focused on rural rather than urban areas, resulting in recruitment from more high schools. On the other hand, the project director and advisory group at another project worked to arrange recruitment from only one school, but found that the school system resisted this approach for its own reasons.

So far as could be determined during site visits, all projects generally applied the family income guidelines, often relying on information that the family was on welfare or lived in public housing. In eight projects it appeared that the criteria was explicitly applied and that this involved considerable checking by project staff. Most, but not all, projects asked parents to sign the student's application to UB, and this involved signing a general financial statement. In at least two projects, parents were required to submit a notarized statement of income status, and in two others an outside person or staff member had to sign a statement verifying total family income.

On the question of academic risk and presumed ability to handle postsecondary situations after UB intervention, it appeared that most project directors and counselors relied on school recommendations and personal intuition in selecting UB students. (This was no mean task in many projects, since there was often a larger number of applicants than could be accommodated, especially for the summer program.) There were few absolute criteria reported, though low motivation and low grades relative to other students in the local school system were often used as a basis for selection. On the other hand, some projects looked for clear evidences of high motivation, and others allowed for students with high academic performance (but low income). Staff in three projects reported that a fair number of UB prospects had already stated their interest in college and had begun or submitted applications, leaving a considerable question about the definition of "academic risk."

2. Followup of UB College Placements

There was little evidence of systematic followup of students after completing the UB program. Only one visited project reported having a comprehensive followup activity, tracking (and assisting where possible) students through four years of postsecondary training. This project had appropriate records to illustrate its procedure. A second project reported carrying out a retrospective followup on students who had completed UB within the previous four years. This was done through college registrars' offices.

Most other efforts were minimal or nonexistent. Seven projects indicated that they followed only the students at the host institution (and this usually meant only for the first year). Four projects apparently had no records or data on followup. The final two visited projects were in their first year and had not formulated plans for followup activities.

III. PROGRAMMATIC CHARACTERISTICS

Through an examination of project application forms, UB projects were known to offer a wide variety of services to their participants. This examination also suggested that different projects concentrated their efforts on differing sets of services or activities. This section considers staff questionnaire responses concerning the activities that were offered by the 54 UB projects and the relative emphasis placed on various UB functions. These results may be viewed as national estimates of project level availability and emphasis of specific activities, subject to the standard errors presented in Table 5.1.

A. Program Activities

Project directors were asked whether certain specified activities and services were provided by their project in the 1973 summer and 1973-74 academic year programs. Table 5.2 displays their responses. In general, more projects are seen to have offered various courses, tutoring, counseling, and other services in the summer session than in the academic year. Notable exceptions were activities undertaken to gain postsecondary entry, such as classes in preparing for college examinations; information and counseling about college requirements, costs, financial aid; and help in applying for financial aid. That is, the projects offered more activities during the summer program, consistent with the more intensive nature of the program during the summer; but projects placed greater emphasis on the mechanics of applying to postsecondary institutions during the academic year, when such applications are normally processed. These basic results are consonant with the impressions gained during site visits as reported in the previous section.

The majority of UB projects offered remedial courses in both summer and academic year sessions (reading, 98 and 59 percent, respectively; remedial English, 83 and 58 percent; remedial mathematics, 88 and 52 percent). These are courses that would be needed by students performing poorly in basic high school subjects. Similarly, large proportions of projects offered college preparatory courses in the summer (e.g., nonremedial English, 87 percent; nonremedial mathematics, 83 percent; social

Table 5.2

COURSES, TUTORING, COUNSELING, AND OTHER ACTIVITIES PROVIDED BY UB PROJECTS

Type of Activity	Projects Providing in 1973 Summer[a/] %[c/]	WN	N[d/]	Projects Providing in 1973-74 Academic Year[b/] %[c/]	WN	N[d/]
COURSES AND CLASSES						
1. Courses on Improving Reading	98.4	309	45	59.2	193	29
2. Remedial English Courses	83.1	261	38	57.8	188	28
3. Other English Courses	86.9	273	39	49.9	163	22
4. Remedial Mathematics Courses	88.2	277	41	51.9	169	26
5. Other Mathematics Courses	83.1	261	39	53.8	175	25
6. Courses on Heritage of Minority Groups	65.6	206	29	30.5	99	14
7. Social Sciences Courses	67.8	213	32	37.1	121	17
8. Foreign Language Courses	38.5	121	17	17.7	58	7
9. Music Courses	53.5	168	26	16.4	54	8
10. Art Courses	83.7	263	37	23.1	75	11
11. Special Interest Courses (photography, etc.)	78.3	246	37	24.8	81	13
12. Classes in preparing for college examinations	30.2	95	16	38.1	124	20
13. Classes in learning how to study	61.1	192	28	38.0	124	19
14. Courses taught in two languages	7.3	23	4	1.5	5	1
15. Classes on how to take tests	41.4	130	19	33.2	108	17
TUTORING						
16. Tutoring by professional teachers and counselors	88.2	277	39	80.3	262	37
17. Tutoring by college students	97.8	307	45	72.6	236	35
18. Tutoring by other students in the program	50.9	160	23	32.1	105	16
19. Tutoring by others	29.3	92	12	53.0	173	23
COUNSELING AND OTHER HELP						
20. Individual counseling on personal problems	100.0	314	46	94.6	308	45
21. Vocational or career counseling	97.4	306	44	92.3	301	44
22. Counseling on academic problems	95.2	299	44	94.6	308	45
23. Visits to one or more colleges and other schools	79.3	249	35	66.2	216	32
24. Information and counseling about college requirements, costs, financial aid	89.8	282	41	98.2	320	47
25. Help in choosing a college, vocational, or technical school	90.4	284	41	95.4	311	46
26. Help in applying to college, vocational, or technical schools	76.4	240	36	92.8	302	45
27. Help in applying for financial aid	80.9	254	38	95.6	311	46
28. Help in finding jobs	48.1	151	25	65.1	212	31
OTHER ACTIVITIES AND SERVICES						
29. Sports	98.4	309	45	46.6	152	21
30. Social gatherings	95.2	299	44	85.1	277	40
31. Cultural activities	93.0	292	43	88.5	288	42
32. Medical and dental services	90.7	285	42	74.5	243	35

NOTE: Table based on responses to PDQ question 22. For approximate standard errors of percents, refer to Table 5.1, column A.

[a/] Two of the projects (12 projects, weighted) did not exist during the 1973 summer. The summer percentages are therefore based on those projects which did exist, i.e., 314 (weighted) or 46 (unweighted). There was no item nonresponse. Hence the percent not providing is found as 100 percent minus the percent providing.

[b/] Percentages are based on all projects, or 326 (weighted) or 48 (unweighted). There was item nonresponse because 1 (unweighted) or 5 (weighted) new projects had not yet started an active program during the 1973-74 academic year. This project was responsible for an item nonresponse of 1.5 percent (weighted). Hence, the percent not providing is found as 98.5 percent minus the percent providing.

[c/] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[d/] Numbers do not include instrument nonrespondents.

sciences, 68 percent). These courses were also taught in the academic year session, but at a smaller proportion of projects (from 37 to 52 percent). Among the other courses specified, those in art, special interest, and the heritage of minority groups were available at two-thirds or more of the projects during the summer, while music and foreign language courses were less common (54 and 39 percent, respectively). In the academic year most of these "elective" courses were available in less than a fourth of the projects (with minority heritage offered in 31 percent).

Among the study skills courses, "how to study" classes were most common (51 percent in summer, 38 percent in academic year), followed by classes on how to take tests (41 and 33 percent), and classes in preparing for college examinations (30 and 38 percent).

Considering the tutoring activities, tutoring by college students was nearly universal (98 percent) in the summer, while tutoring by professionals was available at nearly all projects during both sessions. By examining the four types of tutoring and the three types of counseling aggregated within project, it was determined that all responding projects with active program operations offered at least one type of tutoring and one type of counseling in each session.

Over 90 percent of the projects offered sports, social gatherings, cultural activities, and medical/dental services during the summer, while substantial proportions also provided them in the academic year. Even though the mandatory requirement for medical services had been removed at the time of the study,[2] 91 percent of the projects in the summer and 75 percent in the academic year offered such services. It is likely that these figures include provision of referral services as well as direct services.

In summary, all projects reported some form of counseling and tutoring in both sessions; but the availability of remedial, college preparatory, elective, and study skills courses varied more greatly across projects and between sessions. With the exception of study skills classes, these types of courses were more likely to be offered in the 1973 summer session but dropped in the 1973-74 academic year program, which is in concordance with observations at the sample of 15 projects that were visited.

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[2] In the program manual for the 1973-74 program year, the former requirement that "academic institutions ... provide necessary health services for Upward Bound students ...." was changed to a suggestion that such services "may" be provided (see Application Information and Program Manual. An Office of Education Program Administration Manual, 1973-74. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Education Division, OE/BHE, p.37).

B. Program Emphases

Project directors, instructors, and counselors were asked to rank order seven functions in terms of the relative emphasis placed on them at their projects during the 1973 summer and 1973-74 academic year programs (with "1" denoting the most emphasized function). Within each project, the rank orders assigned to each activity by the project's instructors or counselors were averaged so that each activity had a mean rank for each staff category. For analysis purposes, the ranks of 1 through 3[3/] were considered to form one response category (function was among three most emphasized), while numerically greater ranks formed another response category. For each staff category, two proportions (percent answering that a given function was among the three most emphasized, and the percent answering it was not) were determined for each function and are presented in Table 5.3 through Table 5.5 for project directors, instructors, and counselors, respectively.[4/]

It is seen in Tables 5.3 through 5.5 that for both summer and academic year programs, the highest percentages of projects by far (more than 75 percent), according to each of the three staff groups, placed both tutoring or remedial instruction and counseling among the three most emphasized functions. For the summer session, the third most highly emphasized function was cultural enrichment activities, which was placed among the three most emphasized functions by 32 percent, 53 percent, and 29 percent of the projects, according to project directors, instructors, and counselors,

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[3/] More accurately, mean ranks of 1.0 to 3.49, respectively.

[4/] The proportions ranking functions as being among the three most emphasized and as not being among the three most emphasized were used rather than other statistics (such as median ranks) because not all respondents ranked all seven functions. Thus, the number of cases forming the denominator for each function varied with the function.

RANKING OF EMPHASIS PLACED ON VARIOUS PROGRAM FUNCTIONS

Type of Function		1973 Summer Percentage of Project Directors Ranking: Function as Among Three Most Emphasized	Function as Fourth Most Emphasized or Less	Indeterminate[a/]	Total[b/]	1973-74 Academic Year Percentage of Project Directors Ranking: Function as Among Three Most Emphasized	Function as Fourth Most Emphasized or Less	Indeterminate[a/]	Total[b/]
Tutoring/Remedial Instruction	%[c/]	75.1	13.5	11.1	100.0	77.0	15.9	7.5	100.0
	WN	245	44	36	326	251	52	24	326
	N[d/]	37	6	5	48	38	7	3	48
Counseling	%	74.5	13.8	11.1	100.0	82.5	10.4	7.5	100.0
	WN	243	45	36	326	269	34	24	326
	N	36	7	5	48	40	5	3	48
Liaison Work With School and Comm. Representatives	%	14.1	74.8	11.1	100.0	54.6	37.7	7.5	100.0
	WN	46	244	36	326	178	123	24	326
	N	7	36	5	48	27	18	3	48
Medical/Dental Health Services or Referrals	%	12.6	76.1	11.1	100.0	6.1	86.5	7.5	100.0
	WN	41	248	36	326	20	282	24	326
	N	6	37	5	48	2	43	3	48
Cultural Enrichment Activities	%	31.6	57.4	11.1	100.0	5.5	87.1	7.5	100.0
	WN	103	187	36	326	18	284	24	326
	N	16	27	5	48	3	42	3	48
Social Activities (other than cultural Enrichment)	%	9.5	78.8	11.1	100.0	4.3	88.0	7.5	100.0
	WN	31	257	36	326	14	287	24	326
	N	4	39	5	48	2	43	3	48
Parental Involvement	%	12.9	76.1	11.1	100.0	25.4	66.9	7.5	100.0
	WN	42	248	36	326	83	218	24	326
	N	7	35	5	48	14	31	3	48

NOTE: Table based on responses to PDQ question 17. For approximate standard errors of percents, refer to Table 5.1, column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total exactly due to rounding error.

c/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

d/ Numbers do not include instrument nonrespondents.

Table 5.4

INSTRUCTORS' RANKINGS (AGGREGATED BY PROJECT) OF EMPHASIS PLACED ON VARIOUS PROGRAM FUNCTIONS

Type of Function		1973 Summer				1973-74 Academic Year			
		Percentage of Projects				Percentage of Projects			
		Ranking Function as Among Three Most Emphasized	Ranking Function as Fourth Most Emphasized or Less	Indeterminate[a]	Total[b]	Ranking Function as Among Three Most Emphasized	Ranking Function as Fourth Most Emphasized or Less	Indeterminate[a]	Total[b]
Tutoring/Remedial Instruction	%[c]	85.1	4.7	10.3	100.0	68.4	6.4	25.2	100.0
	WN	277	15	33	326	223	21	82	326
	N[d]	46	2	6	54	36	3	15	54
Counseling	%	87.9	3.3	8.8	100.0	66.7	9.7	23.5	100.0
	WN	287	11	29	326	218	32	77	326
	N	47	2	5	54	35	5	14	54
Liaison Work With School and Community Representatives	%	2.2	84.5	13.3	100.0	19.4	55.5	25.2	100.0
	WN	7	275	43	326	63	181	82	326
	N	1	45	8	54	12	27	15	54
Medical/Dental Health Services or Referrals	%	13.0	73.7	13.3	100.0	5.9	62.8	31.3	100.0
	WN	42	240	43	326	19	205	102	326
	N	7	39	8	54	3	33	18	54
Cultural Enrichment Activities	%	53.0	38.3	8.8	100.0	28.2	45.7	26.1	100.0
	WN	173	125	29	326	92	149	85	326
	N	29	20	5	54	14	25	15	54
Social Activities (other than cultural enrichment)	%	17.3	74.0	8.8	100.0	10.2	66.3	23.5	100.0
	WN	56	241	29	326	33	216	77	326
	N	10	39	5	54	5	35	14	54
Parental Involvement	%	7.9	83.4	8.8	100.0	14.0	60.9	25.2	100.0
	WN	26	272	29	326	46	198	82	326
	N	4	45	5	54	7	32	15	54

NOTE: Table based on responses of instructors, aggregated by project, to PIQ question 25. For approximate standard errors of percents, refer to Table 5.1, column B.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[b] Weighted numbers and percentages may not total exactly due to rounding error.

[c] Percentages are based on weighted responses.

[d] Numbers include all 54 sampled projects.

Table 5.5

COUNSELORS' RANKINGS (AGGREGATED BY PROJECT) OF EMPHASIS PLACED ON VARIOUS PROGRAM FUNCTIONS

Type of Function		1973 Summer				1973-74 Academic Year			
		Percentage of Projects				Percentage of Projects			
		Ranking Function as Among Three Most Emphasized	Ranking Function as Fourth Most Emphasized or Less	Indeterminate[a]	Total[b]	Ranking Function as Among Three Most Emphasized	Ranking Function as Fourth Most Emphasized or Less	Indeterminate[a]	Total[b]
Tutoring/Remedial Instruction	%[c]	78.9	3.6	17.4	100.0	73.7	6.2	20.1	100.0
	WN	240	11	53	304	224	19	61	304
	N[d]	41	2	8	51	38	3	10	51
Counseling	%	75.0	7.6	17.4	100.0	80.3	3.6	16.1	100.0
	WN	288	23	53	304	244	11	49	304
	N	39	4	8	51	41	2	8	51
Liaison Work With School and Community Representatives	%	4.9	75.7	19.4	100.0	42.1	41.5	16.1	100.0
	WN	15	230	59	304	128	126	49	304
	N	3	39	9	51	21	22	8	51
Medical/Dental Health Services or Referrals	%	8.6	69.4	22.0	100.0	8.9	71.0	20.1	100.0
	WN	26	211	67	304	27	216	61	304
	N	4	37	10	51	4	37	10	51
Cultural Enrichment Activities	%	43.4	38.8	17.4	100.0	17.8	61.9	20.4	100.0
	WN	132	118	53	304	54	188	62	304
	N	22	21	8	51	10	31	10	51
Social Activities (other than cultural enrichment)	%	20.7	59.9	19.4	100.0	7.9	72.0	20.1	100.0
	WN	63	182	59	304	24	219	61	304
	N	11	31	9	51	4	37	10	51
Parental Involvement	%	15.5	67.1	17.4	100.0	23.7	60.2	16.1	100.0
	WN	47	204	53	304	72	183	49	304
	N	8	35	8	51	12	31	8	51

NOTE: Table based on responses of counselors, aggregated by project, to PCQ question 20. For approximate standard errors of percents, refer to Table 5.1, column C.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[b] Weighted numbers and percentages may not total exactly due to rounding error.

[c] Percentages are based on weighted responses.

[d] Numbers include all 54 sampled projects.

respectively. While the relative importance of cultural enrichment was the same for the three staff categories, the responses of instructors were clearly discrepant from those of counselors and project directors. Instructors in a project more often rated this function as among the three most emphasized functions. Clearly, the same project is available for all staff members to observe, but it is possible that perception of project emphasis is related to the role of the staff member. The difference could, however, be artifactual, and reflect nothing more than a differential response set established by the PIQ or the fact that instructors were more conscientious in assigning ranks to the functions (i.e., used the ranks 2 through 7 more frequently than directors or counselors).

For the academic year session, the function third most emphasized by projects was cultural enrichment activities according to instructors. But for project directors and (aggregated) counselors, the third most emphasized function across projects was liaison work with school and community representatives (55 percent of projects according to directors and 42 percent of projects according to counselors placed this function among the three most emphasized).

In summary, tutoring or remedial instruction and counseling were ranked by most projects (as represented by project directors, instructors, and counselors) as the two UB functions receiving the most emphasis in the projects. Cultural enrichment activities and liaison work with school and community representatives placed a distant third for the summer and academic year sessions, respectively. These empirically determined indices of program emphasis were supported by the findings during site visitation.

IV. INTRAPROJECT RELATIONSHIPS

The cohesiveness within the UB projects and the extent to which distinct subgroups of project personnel see others as supporting their role are matters of direct concern for project operation. Some information regarding the various interpersonal relationships existing among subgroups of staff members and students within the UB projects is the focus of this section. Some data addressing this topic were collected in the staff questionnaires; other information was gained during the site visits to 15 of the 54 sample projects. Findings from both sources will be presented in this section.

Instructors and counselors were asked, in the respective staff questionnaires, to evaluate (on a five-point scale from very unsupportive to very supportive) the extent to which project directors supported their work. The responses were aggregated by project within each of these two staff categories and are presented in Table 5.6. Project director support of instructors and counselors would appear to be quite good, but at the project level it is seen in a slightly more favorable light by instructors. In 57 percent of the projects, instructors reported the project director as very supportive, and in 47 percent of the projects, counselors reported a very supportive project director. No project had instructors who, at the aggregate level, reported an unsupportive project director, and in only 8 percent of the projects did counselors see the project director as unsupportive.

The perceived lower level of support of counselors by project directors could result from the inclusion in the counselor category of the college students serving as tutor-counselors. The tutor-counselors, also known as resident advisors or dorm assistants, served the project chiefly in the summer program. Site visits indicated that these college students were to attend classes (and sometimes teach), tutor students at various times, provide counsel, direct dorm and other activities, and in some cases be on 24-hour call for monitoring and supervision of students. From their point of view, however, tutor-counselors at some visited projects noted that their roles were not clear, that they felt too much on their own to create their jobs, and that they therefore felt they were doing less than they should and could. This lack of communication may have resulted in a perceived lack of support. In fact, project level communications with counselors, in general, may have been less effective than with instructors. It was noted during site visits that most of the projects did not include either counselors or tutor-counselors in their regular staff meetings during the summer program.

Table 5.6

SUPPORT OF INSTRUCTORS AND COUNSELORS BY THE PROJECT DIRECTOR

Degree of PD Support	Projects' Instructors %[a]	WN	N[b]	Projects' Counselors %[a]	WN	N[c]
Very unsupportive or Unsupportive	0.0	0	0	8.2	25	4
Indifferent	5.6	19	3	8.9	27	5
Supportive	37.5	123	22	30.9	94	16
Very supportive	56.7	185	29	47.0	143	24
Indeterminate[d]	0.0	0	0	5.3	16	2
Total[e]	100.0	326	54	100.0	304	51
Median rating[f]	4.7			4.6		
Mean rating[f]	4.6			4.2		
Standard error of mean rating	0.08			0.14		

NOTE: Table is based on responses of instructors (aggregated by project) to PIQ question 37, and of counselors (aggregated by project) to PCQ question 31. For approximate standard errors of percents, refer to Table 5.1, column B for instructors; column C for counselors.

[a] Percentages are based on weighted responses.

[b] Numbers include all 54 sampled projects.

[c] Numbers do not include three projects which, at the time of sample selection, had no counselors. Hence the total (unweighted) number of projects with counselors was 51.

[d] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[e] Weighted numbers and percentages may not total exactly due to rounding error.

[f] Mean and median ratings are based on a scale of 1.00 ("very unsupportive") to 5.00 ("very supportive"), and are computed for determinate responses only, without adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, or inconsistent responses.)

An item on all three staff questionnaires asked staff members to evaluate on a five point scale (from very poor to very good) the relationships within and among several groups of individuals within the project. Tables 5.7 through 5.9 present the project level evaluations by directors, instructors, and counselors, respectively, of these intergroup relationships. Clearly, whether seen by directors, instructors, or counselors, projects were viewed to have, on the average, good or very good relationships within and among the categories listed (students, staff, and project director). No projects were viewed by project directors as having any very poor or poor relationships, but a small proportion of projects, as reported by instructors and counselors, were characterized by such relationships. Project directors reported that relationships of students to other students were good to very good on the average but not as good as other intergroup relationships (48 percent judged student relationships as very good, whereas 56 percent or more rated other relationships at this level). The instructors and counselors (aggregated by project) also viewed student interactions as good to very good on the average, but did not systematically regard them as better or worse than other types. Otherwise, differences in the evaluation of the various types of relationships were small, both within and between tables. These results would suggest that the project directors, staff, and students formed a highly cohesive group in most projects.

While site visit observations and interviews supported, in general, the very favorable picture painted by the questionnaire responses, exceptions were noted. There was in fact considerable variability in the levels of staff communication and interaction reported--from excellent to entirely unsatisfactory. In three projects in particular, no mechanism was provided for communication among instructors, counselors, and tutor-counselors (and in two cases with senior project staff), and these persons reported staff communication at a very low level during face-to-face interview. They also reported that students suffered from lack of staff cohesion and awareness, and that there was a tendency for project stagnation to occur. On the other hand, there was ample indication in many of the visited projects that communications were regular, meaningful, and maintained at a high level. In two projects, for example, the total staff and student body met on

Table 5.7

INTERGROUP RELATIONSHIPS IN THE PROJECT AS EVALUATED BY PROJECT DIRECTORS

Type of Intergroup Relationship		Percentage and Number of Project Directors					Median Rating[b]
		Very Poor-Poor	Fair	Good	Very Good	Total[a]	
Students and Other Students	%[c]	0.0	17.3	34.8	47.9	100.0	
	WN	0	56	114	156	326	4.4
	N[d]	0	6	17	25	48	
Students and Staff	%[c]	0.0	6.5	35.7	57.8	100.0	
	WN	0	21	116	189	326	4.6
	N[d]	0	2	16	30	48	
Students and project director	%[c]	0.0	6.9	37.1	56.0	100.0	
	WN	0	22	121	182	326	4.6
	N[d]	0	2	18	28	48	
Staff and project director	%[c]	0.0	0.0	38.9	61.1	100.0	
	WN	0	0	127	199	326	4.7
	N[d]	0	0	19	29	48	
Staff and other staff	%[c]	0.0	3.6	37.9	58.4	100.0	
	WN	0	12	124	190	326	4.6
	N[d]	0	2	18	28	48	

NOTE: Table based on responses to PDQ question 28. For approximate standard errors, refer to Table 5.1, column A.

[a] Weighted numbers and percentages may not total exactly due to rounding error.

[b] Median ratings are based on the scale of 1 to 5 for "very poor" to "very good," respectively.

[c] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[d] Numbers do not include instrument nonrespondents.

Table 5.8

INTERGROUP RELATIONSHIPS IN THE PROJECT AS EVALUATED BY THE PROJECT'S INSTRUCTORS

Type of Intergroup Relationship		Percentage and Number of Projects					Median Rating[b/]	Mean Rating[b/]	Standard Error of Mean Rating
		Very Poor-Poor	Fair	Good	Very Good	Total[a/]			
Students and students	%[c/]	1.1	11.1	57.0	30.8	100.0	4.5	4.3	0.08
	WN	4	36	186	100	326			
	N[d/]	1	5	30	18	54			
Students and staff	%[c/]	0.0	9.0	67.1	23.8	100.0	4.3	4.3	0.08
	WN	0	28	219	78	326			
	N	0	5	36	13	54			
Students and project director	%[c/]	2.8	12.7	47.4	36.9	100.0	4.4	4.3	0.10
	WN	9	42	155	120	326			
	N[d/]	2	7	26	19	54			
Staff and project director	%[c/]	4.5	16.5	43.3	34.4	100.0	4.5	4.2	0.11
	WN	15	54	142	115	326			
	N[d/]	2	10	23	19	54			
Staff and staff	%[c/]	1.9	9.1	60.5	28.4	100.0	4.3	4.3	0.11
	WN	6	30	198	92	326			
	N[d/]	1	5	32	16	54			

NOTE: Table based on responses of instructors, aggregated by project, to PIQ question 38. For approximate standard errors of percents, refer to Table 5.1, column B.

[a/] Weighted numbers and percentages may not total exactly due to rounding error.

[b/] Mean and median ratings are based on a scale of 1 ("very poor") to 5 ("very good").

[c/] Percentages are based on weighted responses.

[d/] Numbers include all 54 sampled projects.

Table 5.9

INTERGROUP RELATIONSHIPS IN THE PROJECT AS EVALUATED BY THE PROJECT'S COUNSELORS

Type of Intergroup Relationship		Percentage and Number of Projects						Median Rating[c]	Mean Rating[c]	Standard Error of Mean Rating
		Very Poor-Poor	Fair	Good	Very Good	Non-Response[a]	Total[b]			
Students and students	%[d]	0.0	10.8	54.9	31.6	2.6	100.0	4.3	4.3	0.07
	WN	0	33	167	96	8	304			
	N[e]	0	6	28	16	1	51			
Students and staff	%[d]	0.0	8.6	60.2	28.9	2.6	100.0	4.3	4.3	0.07
	WN	0	26	183	88	8	304			
	N[e]	0	5	29	16	1	51			
Students and project director	%[d]	3.9	8.9	44.8	40.1	2.6	100.0	4.5	4.3	0.12
	WN	12	27	136	122	8	304			
	N[e]	2	6	22	20	1	41			
Staff and project director	%[d]	3.9	10.5	46.6	36.2	2.6	100.0	4.5	4.3	0.13
	WN	12	32	142	110	8	304			
	N[e]	2	6	23	19	1	51			
Staff and staff	%[d]	1.3	17.1	56.9	22.0	2.6	100.0	4.1	4.1	0.13
	WN	4	52	173	67	8	304			
	N[e]	1	9	28	12	1	51			

NOTE: Table based on responses of counselors, aggregated by project, to PCQ question 32. For approximate standard errors of percents, refer to Table 5.1, column C.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[b] Weighted numbers and percentages may not total exactly due to rounding error.

[c] Mean and median ratings are based on a scale of 1.00 ("very poor") to 5.00 ("very good"), and are computed for determinate responses only, without adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, inconsistent responses).

[d] Percentages are based on weighted responses.

[e] Numbers do not include three projects which, at the time of sample selection, had no counselors. Hence the total (unweighted) number of projects with counselors was 51.

occasion; and in two others the entire staff participated in the weekly meetings. In addition, there appeared to be regular paper communication, advance notices of program changes and requirements, and a general sense that all staff members were "on the same team." A lack of communication at some projects with counselors and tutor-counselors has previously been noted, but during site visit there was also variation in project practices concerning summer instructors. Instructors in seven projects were more or less provided with the syllabus and materials they were to employ, many curricular decisions having been made without consultation. In the other eight projects, former and prospective instructors were purposely involved by the staff in developing the summer program, and then were quite independent in directing course content and structure.

It was apparent that instructors were viewed quite differently across projects. Instructors also "behaved" quite differently with respect to personal involvement. In three of the visited projects in particular, they were removed (or even aloof) from the students and the program except during morning class hours. In other projects, however, instructors participated much more extensively by directly tutoring students, accompanying them on field trips, counseling, and otherwise functioning as an integral part of the program. The level of commitment was quite obviously related to selection of the staff and to what was outlined and expected by the senior project staff, and in some projects complete commitment was expected, and obtained.

The overall picture obtained during the site visits was that most projects operated at a high level of efficiency, coordination, and communication; however, a few projects appeared to be at the other end of the scale, which was not as evident in the questionnaire responses. Suffice it to note that certain projects suffered from a combination of operational disadvantages (as observed and as discussed by interviewees), which hampered the staff's feeling of solidarity and effectiveness. These operational aspects (several of which were apparent in each of these few projects) included the following: (a) unclear role descriptions of instructors and tutor-counselors, (b) little or virtually no means for staff communication and interaction in the summer program, (c) no staff training, no staff meetings, and limited or negligible staff input into the UB courses and program, (d) sense of disorganization, lack of planning, unpreparedness to handle day-to-day crises or even standard needs, (e) unwillingness of the project director to delegate responsibility and make best use of total staff talents, (f) unclear purposes, goals, objectives, (g) class attendance not enforced, checked, or even expected, and (h) limited coordination of courses, schedules, requirements, and activities.

Even at the most disorganized and uncommunicative visited project, however, there was a high degree of camaraderie among the students and a particular loyalty to the program and its staff. This generally high cohesiveness among students seemed somewhat greater at projects where they had been involved in some way in course selection, advisory groups, planning for trips, or general program plans.

V. RELATIONSHIPS WITH OTHER GROUPS AND ORGANIZATIONS

A considerable portion of project success would seem to be related to relationships with institutions, groups, or organizations external to the individual project but closely related to project operation. The host institution (typically an institution of postsecondary education, PSE) is one of the most obvious of these. Certain minimal expectations, in connection with the requirements of the official guidelines, are placed on host institutions to evidence their commitment to the UB program (related to admitting UB students, providing access to institutional facilities, and involvement of college instructors).

The project is also quite dependent on other educational institutions at both the high school and PSE level. These are the institutions which serve, respectively, as the source and ultimate recipients of UB students. Projects may also benefit from good relationships with other programs for the disadvantaged, notably the other two TRIO programs.[5/]

[5/] The TRIO programs, sponsored by USOE, are UB, Talent Search, and Special Services.

For their funds and operational guidelines, projects are dependent on the national UB program as administered by the USOE regional offices. Program guidelines encourage maintaining good relationships with the community that is served by the projects and the use of community sources in program operations, in the form of advisory committees.

This section examines the relationships between the UB programs and these external groups and organizations. Results from staff questionnaires and site visit reports will be presented.

A. Host Institutions

For the sample of 54 projects there were only two types of host institutions, public and private educational institutions. Other eligible types of agencies, such as consortia of educational institutions or other agencies, private, nonprofit, or public agencies, were not sampled.[6] The project directors in the sample reported that 90 percent of their host institutions were 4-year colleges, while the remainder were 2-year colleges.[7]

Table 5.10 presents directors' reports of whether the agency hosting their project administered a variety of other programs for the disadvantaged, and if they did, the degree of cooperation between the UB projects and these other programs. A small minority (14 percent) of the host institutions administered Talent Search projects, and nearly half (45 percent) administered Special Services projects (the other two components of the TRIO program). Larger proportions of the host agencies administered other federal and nonfederal programs for the disadvantaged (53 and 65 percent, respectively). These statistics should be treated with caution, however,

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[6] According to USOE records, of the 415 projects operating in program year 1973-74, 25 projects were sponsored by these other types of agencies (see Table 6 of "Program Review of the Special Programs for the Disadvantaged, Division of Student Support and Special Programs, Office of Education," Statement by Leonard H. O. Spearman, before the Office of Management and Budget on August 19, 1974). These consisted of 5 secondary schools, 3 proprietary institutions, 2 public agencies, 7 private agencies, and 8 "other." The USOE data do not reveal whether these 25 projects were part of the universe of projects included in the present study (i.e., regular projects in the coterminous United States). If they were, none were selected into the study sample.

[7] These percentages were based on the answers of 48 respondents (unweighted N) to question 14 of the PDQ.

Table 5.10

ADMINISTRATION OF VARIOUS OTHER PROGRAMS BY HOST INSTITUTION AND PROJECT COOPERATION WITH SUCH OTHER PROGRAMS

Other Programs for Disadvantaged		Percentages and Numbers of Projects						
			Sponsor does administer; degree of cooperation is:					
		Sponsor Doesn't Administer	Very Low/ Low	Moderate	High	Very High	Indeterminate[a]	Total[b]
Talent Search	%[c]	66.2	0.0	5.6	0.0	8.1	20.0	100.0
	WN	216	0	18	0	27	65	326
	N[d]	29	0	2	0	5	12	48
Special Services	%	43.6	2.6	5.2	14.0	23.2	11.4	100.0
	WN	142	8	17	46	76	37	326
	N	19	1	2	7	12	7	48
Other Federal Programs for the Disadvantaged	%	21.1	0.0	9.8	19.9	23.3	25.9	100.0
	WN	69	0	32	65	76	84	326
	N	10	0	4	11	10	13	48
Nonfederal Programs for the Disadvantaged	%	14.0	1.9	16.5	19.1	27.4	21.1	100.0
	WN	46	6	54	62	89	69	326
	N	7	1	7	10	12	11	48

NOTE: This table is based on responses to PDQ question 12. For approximate standard errors of percents, refer to Table 5.1, column A.

[a] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[b] Weighted numbers and percentages may not total exactly due to rounding error.

[c] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[d] Numbers do not include instrument nonrespondents.

because for each of these programs about 20 percent of the projects provided no interpretable response.

Table 5.11 shows the degree of support reportedly received from the sponsoring host institution (as well as from a number of other sources). No project director rated his sponsoring institution as nonsupportive. Nearly half (49 percent) rated their sponsors as very supportive, while a slightly smaller proportion (42 percent) rated them as supportive. It should be noted that nearly all other groups listed were also rated, on the average, as being somewhere between supportive and very supportive. Only the regional and the national USOE offices were rated as being unsupportive by any project directors--and this was done by only a small minority (only one and six respondents, respectively). These matters will, however, be considered in subsequent subsections.

Closely related to the previous table, Table 5.12 provides project directors' reports of whether or not a variety of groups made recommendations to the projects, and, if so, the quality of these recommendations. Only 8 percent of the directors reported that their host institutions had made no recommendations. Most project directors reported that recommendations had been made by sponsors and that they were good (39 percent) or excellent (20 percent). Recommendations were also made by staff and students of all projects, and were the most highly rated of the groups considered; 98 percent of the project directors thought staff recommendations were good or excellent, while 91 percent judged student recommendations similarly. It is seen in this table that only the national office of USOE was reported by a sizable proportion (36 percent) of the project directors not to have made recommendations.[8/] This probably is related to the project directors' perception that the national office was less supportive than others, as indicated in Table 5.11.

In summary, the questionnaire data indicate that the host institutions of UB projects were generally regarded by the project directors as being supportive of UB and making helpful recommendations to the projects. But

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[8/] Due to regionalization of program administration, it is not to be expected that the national office would have much direct contact with the projects.

Table 5.11

PROJECT DIRECTORS' RATINGS OF THE DEGREE OF SUPPORT RECEIVED FROM VARIOUS GROUPS

Type of Group		Very Unsupportive or Unsupportive	Indifferent	Supportive	Very Supportive	Indeterminate a/	Total b/	Mean Degree of Support c/	Median Degree of Support c/
Upward Bound Students	% d/	0.0	7.5	21.4	71.1	0.0	100.0	4.64	4.80
	WN	0	24	70	232	0	326		
	N e/	0	3	10	35	0	48		
Students' Families	% d/	0.0	16.9	41.6	41.6	0.0	100.0	4.25	4.98
	WN	0	55	135	136	0	326		
	N e/	0	7	22	19	0	48		
Local Community	% d/	0.0	18.5	63.7	15.5	2.3	100.0	3.98	3.98
	WN	0	60	208	51	8	326		
	N e/	0	9	31	7	1	48		
Host Institution or Agency	% d/	0.0	9.4	42.1	48.5	0.0	100.0	4.39	4.46
	WN	0	31	137	158	0	326		
	N e/	0	4	20	24	0	48		
"Feeder" High Schools	% d/	0.0	5.2	52.0	42.7	0.0	100.0	4.38	4.36
	WN	0	17	170	139	0	326		
	N e/	0	3	26	19	0	48		
Regional Office of USOE	% d/	1.7	10.6	38.9	48.7	0.0	100.0	4.33	4.47
	WN	6	35	127	159	0	326		
	N e/	1	6	20	21	0	48		
National Office of USOE	% d/	12.5	25.2	27.9	29.5	4.8	100.0	3.68	3.90
	WN	41	82	91	96	16	326		
	N e/	6	13	16	11	2	48		

NOTE: Tables based on responses to PDQ question 27. For approximate standard errors of percents, refer to Table 5.1, column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total to 100 due to rounding error.

c/ These median and mean ratings are based on a scale of 1 ("very unsupportive") to 5 ("very supportive") and are based on determinate responses only, with no adjustments for indeterminate responses (multiple, out-of-range, or inconsistent responses).

d/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

e/ Numbers do not include instrument nonrespondents.

Table 5.12

EXISTENCE AND QUALITY OF RECOMMENDATIONS RECEIVED BY VARIOUS GROUPS AS PERCEIVED BY PROJECT DIRECTORS

Type of Group		Percentage and Number of Projects							Mean Rating[c]	Median Rating[c]
		No Recommendation Made	Recommendations Made and They Were:				Indeterminate[a]	Total[b]		
			Poor	Fair	Good	Excellent				
Student Recommendations	%[d]	0.0	0.0	9.3	41.5	49.1	0.0	100.0	3.40	3.48
	WN	0	0	30	135	160	0	326	326	326
	N[e]	0	0	4	20	24	0	48		
Staff Recommendations	%[d]	0.0	0.0	1.7	31.9	66.3	0.0	100.0	3.65	3.75
	WN	0	0	6	104	216	0	326	326	326
	N[e]	0	0	1	15	32	0	48		
Parent Recommendations	%[d]	5.5	2.3	19.1	54.1	19.0	0.0	100.0	3.00	2.97
	WN	18	8	62	176	62	0	326	304	304
	N[e]	3	1	8	27	9	0	48		
Community Group Recommendations	%[d]	9.1	4.8	26.7	46.0	9.6	3.8	100.0	2.82	2.76
	WN	30	16	87	150	31	12	326	284	284
	N[e]	4	3	13	21	5	2	48		
Host Institution/ Agency Recommendations	%[d]	8.1	3.7	29.5	39.1	19.6	0.0	100.0	2.81	2.83
	WN	26	12	96	127	64	0	326	300	300
	N[e]	4	2	15	19	8	0	48		
Regional Office Recommendations	%[d]	6.3	5.6	20.0	40.8	25.2	2.2	100.0	3.03	3.00
	WN	21	18	65	133	82	7	326	298	298
	N[e]	3	3	12	13	11	1	48		
National Office Recommendations	%[d]	36.2	6.7	31.2	12.7	8.6	4.6	100.0	2.35	2.23
	WN	118	22	102	41	28	15	326	193	193
	N[e]	18	4	14	6	4	2	48		

NOTE: Table based on responses to PDQ question 26. For approximate standard errors of percents, refer to Table 5.1, Column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total to 100 due to rounding error.

c/ Mean and median ratings are based on a scale of 1 ("poor") to 4 ("excellent"), and were computed for determinate responses only, with no adjustments for indeterminate responses (multiple, out-of-range, or inconsistent responses).

d/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

e/ Numbers do not include instrument nonrespondents.

they were not thought to be as supportive or helpful as UB staff and students. On the other hand, the host institutions were perceived to be more supportive and making more helpful recommendations than the regional or national offices of the USOE. This observed set of findings suggests a direct relationship between perceived support and helpfulness of a group and the degree to which that group is proximal to the project.

The site visits provided a unique opportunity to observe relationships between projects and host institutions and to document some of the services which the hosts provided. The following discussion is based on observations and interviews with project staff and representatives of the host institution.

The USOE expects host institutions to enroll a significant number of students from their own UB projects (and from others). Among the 15 visited projects, this commitment was met to differing degrees. The percentage of UB seniors in the project admitted to host institutions ranged from a high of 50 percent to a low of less than 10 percent. Most of the institutions apparently provided adequate financial aid to admitted UB graduates and three institutions reported that they gave a full tuition scholarship to those who were accepted.

Most projects had the services of some of the host institutions' own regular teaching staff; however, college instructors often represented only a small proportion of the UB instructors. Moreover, the majority of project directors held faculty or administrative status. It appeared that nearly all institutions made campus facilities available to UB students on an equal basis with regular college students.[9/]

Virtually all visited projects appeared to have at least adequate facilities provided for the functioning of the summer program (including classroom space, study space, cafeteria, lounge, library, dorms, and meeting rooms), although one project's dorm space was so limited that half of the group used it while the other half went home every day. Some projects were less fortunate with respect to facilities for recreation and other activities

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[9/] In two instances, there were restrictions on the use of the student union or the swimming pool (which the institution itself had to rent); and in one case the institution had no summer session and thus the UB students were actually an isolated group housed in very comfortable quarters but given no opportunity to see or participate in the life of the university.

on a regular basis. Several institutions did not have such facilities and one project appeared to have access only to a small volleyball court. Most projects also had adequate office space and it was usually located conveniently near the center of summer academic and social activities. Generally speaking, academic year facilities were less satisfactory than those provided during the summer. Offices and classrooms were often not so conveniently located. In only two cases, however, did these circumstances appear to be of considerable concern to project staff.

Beyond these requirements and suggestions of the program guidelines, there was other evidence of institutional commitment observed during the site visits. Some of the notable examples were: (1) a continuous program of special services for disadvantaged or minority students so that UB appeared to be part of a larger program of services, concern, and action; (2) development of special college courses or programs for disadvantaged; (3) provision of facilities, equipment, buses, etc., without charge; (4) covering costs for students to visit or attend summer programs on other campuses; (5) contribution of summer staff (instructors, counselors, accountant) at no charge or small charge to UB; (6) waivers of fees and deposits for UB applicants; (7) reduced fees or no fees for student union use, dormitory space, food service, and/or tuition for Bridge students; (8) payment of 75 percent of the project director's salary; (9) full or partial financial aid to those accepted; and (10) relaxed admission/retention standards for UB students. Most of the above amount to direct or indirect financial contributions, and indeed a number of the host institutions claimed none or only a part of the 8 percent indirect costs allowable.

In contrast, it should be noted that several institutions definitely did not relax admission/retention standards for UB or similar students, and that some institutional representatives pointed out that they could not possibly continue Upward Bound if federal funds were cut off for any reason. While the latter may not indicate lack of commitment, it illustrates the dependence on outside funding to carry out such a program, even though many of the 15 visited institutions contributed significant proportions of the total program budget.

It should be noted that the official who directly supervised program operation at one of the visited institutions indicated a considerable lack of commitment, in that he saw UB as an opportunity to increase funds for the college and help to pay faculty salaries. That institution was also one of those few deemed to be operating an essentially unplanned, uncoordinated UB program, and was the only site visited at which real communications difficulties between the UB project staff and the host institution were revealed. At that project, the director found that he could not write or even authorize checks, since the institution's treasurer had personal control of the project's finances.

It should also be pointed out that a few projects apparently had to live with certain restrictions or pressures imposed by the institution that affected operations, staffing, or program. Two projects found, for example, that the college library had to close early each day (with no other provision for study space, periodicals, or reference books). On one campus, UB staff could not live in the dorms with the students, since there was a ruling requiring the services of a college housemother. In two additional projects, the staff had little or nothing to say in the hiring of summer instructors and tutor-counselors, and had to accept those whom the institution provided.

With the exceptions noted, relationships with host institutions were seen as quite good at the large majority of visited projects, supporting the results of the questionnaire data. The complete lack of adverse ratings of host institutions in the questionnaire responses does, however, cast some doubt on the validity of those responses, in light of the problems found to exist at some visited projects. The lack of adverse ratings cannot be explained by item nonresponse in this instance, since none existed; however, the failure of six project directors to return the questionnaire may account for some of the discrepancy.

B. Other Educational Institutions

Tables 5.13 and 5.14 display the ratings, by UB instructors and counselors (aggregated by project), respectively, of the degree of cooperation received from high schools and PSE institutions in performing their UB functions. Good to excellent cooperation from high schools was reportedly

Table 5.13

COOPERATION PROJECT RECEIVED FROM HIGH SCHOOLS AND POSTSECONDARY INSTITUTIONS: INSTRUCTOR RATINGS

of Institution		Percentage and Number of Projects					Median Rating c/	Mean Rating c/	Standard Error of Mean Rating
		Poor-Fair	Good	Excellent	Indeterminate a/	Total b/			
Schools	%d/	18.8	46.7	25.7	8.9	100.0			
	WN,	68	162	83	29	326	3.1	3.1	0.12
	Ne/	11	25	13	5	54			
secondary itutions	%d/	3.1	60.9	28.5	7.4	100.0			
	WN,	10	198	94	24	326	3.4	3.4	0.05
	Ne/	2	33	14	5	54			

Table based on responses of instructors, aggregated by project, to PIQ question 39. For approximate standard errors of percents, refer to Table 5.1, column B.

otes follow Table 5.14.

Table 5.14

COOPERATION PROJECT RECEIVED FROM HIGH SCHOOLS AND POSTSECONDARY INSTITUTIONS: COUNSELOR RATINGS

of Institution		Percentage and Number of Projects					Median Rating c/	Mean Rating c/	Standard Error of Mean Rating
		Poor-Fair	Good	Excellent	Indeterminate a/	Total b/			
Schools	%d/	6.9	41.8	43.8	7.9	100.0			
	WN,	21	127	133	24	304	3.5	3.4	0.09
	Ne/	4	21	22	4	51			
econdary tutions	%d/	14.1	52.3	29.9	4.3	100.0			
	WN,	43	159	91	13	304	3.2	3.2	0.09
	Ne/	7	27	15	2	51			

Table based on responses of counselors, aggregated by project, to PCQ question 33. For approximate standard errors of percents, refer to Table 5.1, column C.

his represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, -range responses, and inconsistent responses.

eighted numbers and percentages may not total exactly due to rounding error.

ean and median ratings are based on a scale of 1.00 ("poor") to 4.00 ("excellent"); and are completed for inate responses only, without weight adjustments for item nonresponse or indeterminate responses (multiple, -range, or inconsistent responses).

ercentages are based on weighted responses.

umbers do not include three projects which, at the time of sample selection, had no counselors. Hence the (unweighted) number of projects with counselors was 51.

enjoyed by 72 percent of the projects, according to instructors, and 86 percent of the projects, according to counselors. In the opinion of instructors, good to excellent cooperation from PSE institutions was received by 89 percent of the projects; 82 percent of the projects, in the opinion of counselors, had such cooperation.

The cooperation of high schools and PSE institutions is usually very important to the success of UB projects. Projects typically depend on high schools for help in recruiting participants, in providing complementary programs of study for students, etc. Projects also typically are aided by postsecondary institutions in processing UB participants' applications, granting admission and administering financial aid, and sometimes in providing for the needs of UB students in those institutions. Thus the high degree of cooperation reported by instructors and counselors is impressive. However, precisely because of the importance of the schools' cooperation to the success of UB, it is expected that a high degree of cooperation would have been developed.[10/]

The high degree of cooperation from PSE institutions reported in the questionnaires was also indicated during site visits. Since the projects do not share sites with any PSE institution other than the host, it was not possible to confirm this reported cooperation except in the case of the host institution (see previous subsection). In general, the directors (and to a lesser extent counselors) interviewed during site visits reported close and fruitful personal contacts with admission officers and financial aid officers at several PSE institutions. Those relationships had apparently been fostered over a period of years.

Information obtained during site visits indicated that all visited projects enjoyed at least adequate relationships with high schools, and five projects appeared to have excellent communications with the schools. In addition to a general sense of cooperation (provision of transcripts, teacher and counselor recommendations, time for conferences with staff and students), most feeder high schools provided the services of a contact counselor who devoted anywhere from 3 to 10 hours per week to UB activities

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[10/] Cooperation was probably developed both by hard work and by the strategic selection of the schools with which to cultivate relationships.

(in most cases without reimbursement from the project). Moreover, feeder high schools for eight of the visited projects gave time and space for UB staff to recruit and interview students in the fall, and five projects reported that time and space were regularly provided in the schools for UB staff to tutor students during the academic year. Overall, there was a strong sense of cooperation and open communications, although this varied to some extent from school to school.

C. Other Programs

Some indication of the nature of relationshps with other programs is presented in Table 5.10. That table shows the project director's reports of cooperation with other programs administered by the host institution. Although the results were attenuated by a relatively large amount of indeterminate response, the overall thrust of the reported data is that cooperation with these other programs is at least good for the preponderance of cases where they exist. Only two of the 36 responding project directors reported low levels of cooperation with other projects administered by the host institution, one each for a companion special services program and a nonfederal program for the disadvantaged. Table 5.15 presents project directors' reports of other special programs for disadvantaged youth (including, those operated by the host institution) operating in the same geographic area and, if there were such programs, of UB cooperation with them. For each of the other programs listed, the vast majority of UB directors knew whether or not such programs operated in their vicinity. For two programs, Cooperative Vocational Education and Work-Dropout Prevention, a sizable percentage of directors were not knowledgeable (41 and 29 percent, respectively).

According to the project directors' reports, 48 percent of the UB projects did not have other UB projects operating in their area, while a similar proportion did. Talent Search and Special Services projects were usually present in the same area as the UB projects. A large majority of the UB directors reported cooperative relationships with these projects. With the exception of the Job Corps, which did not function near 42 percent of the projects, the remaining programs listed in Table 5.15 often existed

Table 5.15

PROJECT DIRECTORS' REPORTS OF OPERATION OF AND COOPERATION WITH OTHER PROGRAMS IN THE SAME AREA

		Percentage and Number of Project Directors					
				Program is in Area, and:			
Type of Other Programs		Don't Know if in Area	Program Not in Area	Cooperates	Does not Cooperate	Indeterminate a/	Total b/
Other Upward Bound Programs	%c/	2.4	47.6	46.8	0.0	3.2	100.0
	WN	8	155	152	0	10	326
	Nd/	1	21	24	0	2	48
Talent Search	%c/	4.5	28.6	59.3	2.3	5.2	100.0
	WN	15	93	193	8	17	326
	Nd/	2	16	26	1	3	48
Special Services	%c/	4.2	21.8	66.4	1.9	5.7	100.0
	WN	14	71	216	6	19	326
	Nd/	2	12	29	1	4	48
Neighborhood Youth Corps	%c/	4.2	1.5	86.2	4.5	3.6	100.0
	WN	14	5	281	15	12	326
	Nd/	2	1	41	2	2	48
Job Corps	%c/	4.2	42.4	39.2	5.6	8.6	100.0
	WN	14	138	128	18	28	326
	Nd/	2	19	20	3	4	48
Cooperative Vocational Educational Program	%c/	40.6	12.9	34.3	8.9	3.2	100.0
	WN	132	42	112	29	11	326
	Nd/	18	6	18	4	2	48
High School Work-Study Program	%c/	17.5	13.5	42.0	19.3	7.7	100.0
	WN	57	44	137	63	25	326
	Nd/	9	6	21	8	4	48
Work - Dropout Prevention Program	%c/	28.8	24.7	31.0	8.7	6.8	100.0
	WN	94	80	101	28	22	326
	Nd/	14	12	14	4	4	48
High School Equivalency Program	%c/	10.3	6.2	71.4	8.6	3.6	100.0
	WN	33	20	233	28	12	326
	Nd/	6	3	33	4	2	48
Veterans' Programs	%c/	12.3	17.6	50.7	17.5	1.7	100.0
	WN	40	57	166	57	6	326
	Nd/	7	9	21	10	1	48

NOTE: Table based on responses to PDQ question 31. For approximate standard errors of percents, refer to Table 5.1, column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total exactly due to rounding error.

c/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

d/ Numbers do not include instrument nonrespondents.

in the same geographic area as the UB projects. In general, if the other programs operated in the vicinity of UB projects, cooperation existed. Presumably, the UB projects benefited from this type of cooperation as well as the other programs.

This cooperativeness reported in the questionnaire results was also reported during site visits. Some of the specific incidents of cooperation mentioned were: (1) cross referrals of clients; (2) followup and assistance to UB college placements (Special Services program only); and (3) pooling of resources to establish good community relationships.

D. USOE Regional Office

Some indications of relationships with USOE regional offices has previously been presented in Tables 5.11 and 5.12. Only 6 percent of the directors reported that no recommendations had been made by the regional offices, and of those directors who reported having received recommendations, the large majority reported that the recommendations were good to excellent. The regional offices were reported as supportive or very supportive by 87 percent of the directors, as "indifferent" by 11 percent of the directors, and as unsupportive or very unsupportive by 2 percent of the directors.

The nature of project relationships with the USOE regional offices were also investigated during site visitations. It should be pointed out, however, that site visit data is particularly weak in this area due to the fact that no more than two projects were visited in each region and information about the relationship was obtained primarily from the project director. Nevertheless, some insight into these relationships can be gained from the site visits.

The valence of the reported relationship with the USOE regional offices was generally positive, but there was considerable variability. Project directors as a group reported varying degrees of communication with regional offices. Projects in three regions, for example, noted satisfaction in the dispatch with which certain decisions were made. Directors in another region reported that there was regular and adequate communication, including a yearly site visit, a proposal conference, feedback, and a meeting of the region's project directors. The general sense among projects in the six other regions, however, was that there was less than optimal communication. The regional staff responded when asked for assistance, but generally had no systematic program of visiting, monitoring, evaluating, or assisting UB projects. It was also noted that there was little in the way of training for project directors.

Perhaps the most common concern, across projects and across regions, was the timing of notification of funding and consequent actual late funding. Several UB personnel noted that these circumstances hamper program development, the hiring of the best instructors and counselors, the implementation of staff training, student travel and other activities, and that they cause a considerable lowering of staff morale. In two regions it was found that students were already on campus in the summer program before notification was received of the approval of the grant. While these situations reflect more upon the riskiness of the project director (and to some extent on the willingness of the host institution to back him up), apparently some verbal statement of funding had been obtained but written confirmation of the grant had not been received. In all fairness to the regional offices, it should be pointed out that they are but the last link in the chain involving funding and, thus, are constrained from making their funding decisions until other sequential decisions regarding guidelines and available funds have been made within another branch or agency of the federal government.

There were more specific concerns bearing on program management and operations. Staff in several projects felt that regional requirements were often precipitous or counterproductive. For example, a sudden decision at the regional level purportedly required one project to change summer plans at the last moment and to recruit a whole new contingent of older students. Other expressed concerns included: (1) being required to drop students who had been within poverty guidelines at induction but had crept above it a year later; (2) having to meet a certain staff-student ratio requirement at the last moment, making it necessary to release four instructors; (3) rejecting a project's operational definition of "academic risk" without providing any other definition or guidance.

Many of the complaints leveled at the regional offices were possibly misdirected. Project directors seemed to see the regional offices as having more latitude in administering the program than they had in reality. Since the nature of these complaints rarely bear on matters over which the regional offices have control, they will not be documented; however, the misperception on the part of project directors as to the nature of regional office operations does signal a communications or rapport problem.

E. Community and Advisory Groups

Projects are encouraged by the federal regulations and guidelines to utilize community resources in operating UB, in the form of advisory committees. The guidelines further suggest three community-based committee types (Community Resources, Parents, and Academic), and the composition is outlined as consisting of parents, low-income community leaders, and representatives of colleges and high schools. Additionally, a student advisory committee is suggested, to be composed of UB participants.

Table 5.16 shows project directors' reports of having Community Resources, Parent, Academic, or Student Advisory Committees. As seen in the table, 95 percent of the project directors reported the existence of a Parent Advisory Committee, while 82, 70, and 50 percent reported Academic, Student Advisory, and Community Resources Committees, respectively.[11/] The table also shows that in nearly all projects with the specified committees, the committees reportedly met at least twice a year, with most meeting at least four times a year.

The impression of advisory committees gained during site visits was somewhat different. While all but two visited projects had advisory committees, most of these had just one such group. The single committee was typically composed of all the community members suggested in the guidelines plus UB students. In one case, however, the committee was composed entirely of parents. It may be that while actually one committee exists at these projects, subcommittees handle the issues related to community relations, academic matters, student concerns, and parent concerns. Such subcommittees may have been afforded full committee status for purposes of questionnaire completion.

[11/] These percentages exclude projects that either failed to answer these items or reported not having the committees.

EXISTENCE AND FREQUENCY OF MEETINGS OF VARIOUS UPWARD BOUND ADVISORY COMMITTEES

Type of Committee		Percentage and Number of Projects						
			Project has Committee; Meetings Held					
		Project Doesn't Have Committee	Monthly or More	Quarterly	Twice a Year	Less than Twice/Year	Indeterminate[a/]	Total[b/]
Community Resources Committee	%[c/]	39.8	2.8	33.4	13.6	0.0	10.4	100.0
	WN	130	9	109	44	0	34	326
	N[d/]	19	1	17	7	0	4	48
Parent Advisory Committee	%[c/]	0.0	23.5	39.2	26.9	4.6	5.8	100.0
	WN	0.0	77	128	88	15	18	326
	N[d/]	0.0	10	21	13	1	3	48
Academic Advisory Committee	%[c/]	10.2	11.7	45.0	22.8	2.3	8.0	100.0
	WN	33	38	147	74	8	26	326
	N[d/]	6	4	25	9	1	3	48
Student Advisory Committee	%[c/]	21.0	26.0	29.0	13.0	1.7	9.2	100.0
	WN	68	85	95	43	6	30	326
	N[d/]	10	11	14	7	1	5	48

NOTE: Table based on responses to PDQ question 24. For approximate standard errors of percents, refer to Table 5.1, column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total exactly due to rounding error.

c/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

d/ Numbers do not include instrument nonrespondents.

Tables presented earlier (Table 5.11 and 5.12) showed the project directors' evaluation of the support received from community groups. As shown in Table 5.12, project directors rated recommendations received from community groups as good, on the average--not at the level of recommendations from other groups closer to projects (such as students or staff), but better than those of the USOE regional and national offices. The entries in Table 5.11 indicate that the local community was considered by project directors to be supportive, but slightly less supportive than nearly all other groups considered. Thus, it seems that while project directors reported that the interactions of their projects with the community were satisfactory, they were not as good as relationships with groups more closely related to the projects. This is consistent with reports received during site visits.

Table 5.17 lists a number of services that parents or community groups may perform for the UB projects. While the services included in the list may be rendered by any parent or community group, they are ones that the various UB Advisory or Resources Committees are likely to perform.[12] As indicated in the table, all but one of the services on the list were reported to have been performed for at least 74 percent of the projects. The exception was the service of "securing additional funds," which was reported performed at only 43 percent of the projects.[13] Also presented in Table 5.17 are the project directors' ratings of the effectiveness with which the services were performed. On the average, the performance of most services were regarded as moderately effective or slightly better. "Offering suggestions for program improvements" was seen to have been done very effectively, but securing additional funds (the one service performed for less than half of the projects), was seen to have been ineffectively executed, even when performed. One would not expect parent and community groups to be very effective in securing additional funds.

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[12] The question (number 25 of the PDQ) inquired whether parents or community groups had performed the services, neither excluding nor explicitly including the Committees.

[13] These percentages exclude projects not responding to these functions and those reporting they were not performed.

Table 5.17

EXISTENCE AND EFFECTIVENESS OF VARIOUS TYPES OF SERVICES BY PARENTS OR COMMUNITY GROUPS

Type of Function		Percentage and Number of Projects							
		Function Not Performed	Function Performed; Degree of Effectiveness was:					Inde-terminate a/	Total b/
			Very Low	Low	Moderate	High	Very High		
Identification of eligible participants	%c/	2.2	11.9	10.7	38.1	26.7	10.4	0.0	100.0
	WN	7	39	35	124	87	34	0	326
	Nd/	1	5	5	19	12	6	0	48
Identification of potential staff members	%c/	21.4	18.6	14.0	26.7	10.5	4.2	4.6	100.0
	WN	70	61	46	87	34	14	15	326
	Nd/	10	8	8	12	7	2	1	48
Assistance in development or review of project application or proposal	%c/	13.7	10.2	18.6	28.5	18.4	10.5	0.0	100.0
	WN	45	33	61	93	60	34	0	326
	Nd/	6	5	8	14	9	6	0	48
Securing additional funds	%c/	47.4	20.0	5.6	4.8	10.5	2.1	9.4	100.0
	WN	155	65	18	16	34	7	30	326
	Nd/	25	9	3	3	4	1	3	48
Mobilizing community resources and support	%c/	14.6	8.5	16.5	18.8	28.2	11.3	2.2	100.0
	WN	48	28	54	51	92	37	7	326
	Nd/	6	4	6	11	15	5	1	48
Serving as liaison for public and private agencies and institutions	%c/	9.6	9.5	15.5	20.9	22.3	16.1	6.1	100.0
	WN	31	31	50	68	73	53	20	326
	Nd/	4	5	7	11	12	6	3	48
Serving as volunteers	%c/	6.9	21.1	11.0	27.0	12.4	19.3	2.2	100.0
	WN	23	69	36	88	41	63	7	326
	Nd/	4	9	6	12	7	9	1	48
Offering advice and suggestions for program improvements	%c/	2.9	0.0	13.4	24.8	24.8	34.2	0.0	100.0
	WN	9	0	44	81	81	111	0	326
	Nd/	1	0	6	12	13	16	0	48

NOTE: Table based on responses to PDQ question 25. For approximate standard errors, refer to Table 5.1, column A.

a/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

b/ Weighted numbers and percentages may not total exactly due to rounding error.

c/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

d/ Numbers do not include instrument nonrespondents.

Site visit observations indicated that the advisory groups generally functioned in one of two ways. Either they provided some guidance and assistance on routine or emergency matters, or they served public relations functions and aided in raising scholarship money. They were viewed--and viewed themselves--as advisory in nature and not as policy groups, although in two projects advisory members interviewed prospective instructors. Advisory groups at visited projects met anywhere from once to four times a year. There was relatively little indication from project staff of the essentiality of these groups, but they were generally viewed as important to UB for reasons of moral support, communications, and contact with parents. At one project, all school superintendents in the target area were on the project's advisory board. One result of this was exemplary relationships with feeder high schools, and another was the willingness to release school counselors for annual one-day workshops to discuss and study Upward Bound.

VI. COST ANALYSIS

USOE is the primary source of financial resources for the UB program, so it is important that the program be described and analyzed in terms of its financial characteristics and the relationship of those characteristics to other program resources, processes, and outputs. The variability of the distribution of sources and uses of funding will be described, and inferences concerning differences in program economy is expressed.

The primary data source for the cost and staffing pattern analyses was the set of fiscal and staffing questions contained in the PDQ. Attempts were made to obtain other sources of data regarding costs. One such source sought was the Quarterly Financial Report for Upward Bound Projects (OE Form 1227), containing data on the total federal and nonfederal funds approved and expended during the fiscal year for personnel, nonpersonnel, and indirect cost categories. Another financial report, the Annual Financial Audit Report for the 1974 Fiscal Year, was also requested from the projects. This latter report contains beginning and ending balance sheets of project assets and liabilities, and a statement of revenues or receipts, expenditures, and changes in fund balances for the fiscal year.

The use of these supplemental data sources was precluded due to insufficient return of the requested reports. The Quarterly Financial Report for UB (OE Form 1227) was requested from all sample projects but received from only 21. With this limited return rate, the information on OE Form 1227 was of potential use only as a consistency check for the PDQ. Unfortunately, comparable data from the PDQ and OE Form 1227 were available for only 16 projects. The total funding reported on the PDQ for those projects was $124,322, or 8 percent more than the $114,602 reported on OE Form 1227. The sample of 16 comparable projects was too small to derive reliable inferences about the consistency of responses between the two instruments; in fact, differences in the level of funding reported in the questionnaire and OE Form 1227 might be expected for several reasons. Requests for the Audit Report for the 1974 Fiscal Year met with even less success, and the 11 forms provided did not permit the use of this information.

The PDQ responses were thus the only remaining source of fiscal information with a sufficient number of responding projects; however, a considerable potential for error exists in these data. The PDQ solicited an extensive complex of fiscal and staffing information, leading in some cases to complete or partial omissions or misinterpretations of specific details.[14/] The nature of the responses in many questionnaires reflected the difficulties experienced by project directors in allocating costs among the various categories for the summer and academic year programs.

Responses to the questionnaire item concerning the sources and uses of funds were further confounded by alternative treatments of in-kind contributions. In some cases, project directors separated in-kind contributions from their estimates of the sources and uses of funds; in other cases, in-kind contributions were included at their estimated cash value. This created a problem when it could not be determined which approach was taken. A related problem occurred when the question regarding contributions and

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[14/] Site visit verification of these responses during interviews with project directors indicated that all directors questioned (12) had omitted relevant items or had misinterpreted the exact nature of the required fiscal or staff data. Although 15 sites were visited, on three of these visits the responses could not be verified since the PDQ had not been completed prior to the visit.

in-kind payments was not answered. In such cases, the absence of response was assumed to mean that no cash or in-kind contributions were received (an assumption that may or may not be warranted).

Responses to the PDQ were edited and were verified (and revised if necessary) during site visits to insure maximum validity for the analysis. The extent of uncovered discrepancies within and among data sources suggests, however, that instances of double counting, omission, misinterpretation, and response errors very likely remain in the data which were not verified, and the results of the analyses must be interpreted cautiously.

Although questionnaires were mailed to a sample of 54 projects selected from UB projects funded in program year 1973-74, the number of projects for which data were available for analyses of project costs and staffing patterns ranged from 16 to 48,[15/] depending upon the type of association under review. Due to these large variations in item and subitem[16/] response rates, some difficulties were encountered in analysis. For this reason, two types of population estimates for aggregate cost characteristics are presented in this section: (a) unweighted estimates that were computed using unit weights without adjustments for instrument nonresponse; and (b) weighted estimates that were computed using the unequal sampling weights after imputation for missing data.[17/] The unweighted estimates are quite possibly biased due to the combined influence of unequal probabilities of sample selection, unrepresentativeness of nonrespondents, and response discrepancies. The weighted estimates are also subject to response error biases and also include error introduced due to the imperfect relationship in the regression equation used to impute missing values. Thus, while the unweighted estimates have fewer possible sources for bias, they contain an

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[15/] Only 48 projects responded to the PDQ.

[16/] In many instances, project directors would provide total cost figures, but not component costs, or provide total year costs without providing separate breakdowns for the academic year program and the summer program.

[17/] Imputations for missing cost data were determined by using the best fitting linear regression equation between project costs and project size (i.e., number of students served). Sampling weights used were inversely proportional to the probability of project selection.

additional source of possible error. The extent of improvement or deterioration in accuracy of the weighted estimates is, therefore, unknown. The weighted costs (computed for major cost categories--average total project costs and average cost per student for the summer, academic year, and total year program) are presented primarily to provide alternate estimates for comparison.

Unweighted estimates alone are presented for the detailed cost components (e.g., personnel, travel, equipment) within the major cost categories due to the high nonresponse rate for some of these components. The relative level of the detailed cost components to the total cost categories was the issue of analysis, and the ratios were believed to be stable between the weighted and unweighted cost data; therefore, calculations using weighted data are not reported. For the regression analyses, reported in subsections B and C, unweighted data were used throughout.

A. Descriptive Profiles of Project Costs

The cost data from the PDQ were analyzed to obtain a descriptive profile of the UB projects with respect to sources and uses of funds for the 1973 summer program, the 1973-74 academic year program, and the total program year. This profile, illustrating the levels of cost in each category, is contained in Table 5.18 and was derived from data submitted by 35 to 39 UB projects, depending upon the particular category of cost and funding source. Since fewer projects contributed to the estimates of the cost components than to the totals, the sum of the component entries in the columns of Table 5.18 will not equal the total project cost figure given in the table. Totals of the components within a given program session (academic year or summer) will, however, represent the sum of the elements leading to that total.

The unweighted average total cost per project (excluding in-kind contributions) was estimated as $122,206 for the 1973-74 program year. The unweighted total project dollar costs averaged $69,532 for the 1973 summer

Table 5.18

AVERAGE COSTS OF UPWARD BOUND PROJECTS, BY SOURCES OF FUNDS

Cost Categories	1973 Summer Program[a]			1973-74 Academic Year Program[b]			Average Total Cost[c]
	$ From Federal Sources	$ From Nonfederal Sources	Total[d]	$ From Federal Sources	$ From Nonfederal Sources	Total[d]	
Personnel costs:							
Salaries and wages	$26,360	$2,677	$29,037	$26,993	$4,604	$31,597	$60,634
Fringe benefits	2,032	110	2,142	2,446	345	2,791	4,933
Consultants and contract services	175	55	230	275	25	300	530
Travel:							
Student	1,722	111	1,833	1,921	126	2,047	3,880
Other	621	59	680	817	100	917	1,597
Total	2,343	170	2,513	2,715	226	2,941	5,454
Equipment	819	130	949	365	92	457	1,406
Room and Board	17,523	866	18,389	8,551[g]	0	8,551	26,940
Stipends	4,195	117	4,312	9,521	161	9,682	13,994
Tuition	1,325	595	1,920	156	0	156	2,076
Other direct costs	4,704	228	4,932	4,020	453	4,473	9,405
Indirect costs	2,430	867	3,297	2,661	1,587	4,248	7,545
Unweighted total project costs[e]	63,773	5,615	69,532	51,524	6,873	56,226	122,206
Weighted total project costs[f]			63,769			51,863	111,986

NOTE: The average cost values presented in this table are based on data from 35 to 39 project responses, depending on the cost category considered. The component cost figures result from unweighted calculations with no adjustments for instrument or item nonresponse. If some component cost information were given within a program phase (summer or academic year), then omitted items were assumed to be $0.00 within that phase.

[a] Based on the data from 37 to 39 projects.

[b] Based on the data from 35 to 38 projects.

[c] For the composite costs, this represents the simple sum of the total average costs for the two program components. This is not the case for the weighted and unweighted total program costs (see footnotes e and f).

[d] With the exception of total figures, this represents the simple sum of federal and nonfederal figures.

[e] Due to smaller numbers of projects providing component information than total cost information, sums of average component costs within columns do not equal average project cost for that column. The totals within this row will not equal the sum of the averages for the separate program phases or funding sources since the averages are based on data from different subsets of projects.

[f] Computed using sampling weights and imputations for missing values. The total within this row will not equal the sum of the averages for the separate program phases since the averages are based on imputed values computed from different regression equations.

[g] This expenditure for room and board during the academic year (which is not a residential program) is somewhat surprising. Certain expenses might be expected (such as lodging and meals during visits to other institutions or cultural activities at sites of some distance from the project, or rent for some campus facilities used). The entry may, however, reflect error due to the difficulty reported (and observed) of project directors in completing the questionnaire items related to project expenditures.

program and $56,226 for the 1973-74 academic year program.[18] When missing values were imputed and sampling weights were applied, the average yearly cost per project was $111,986, and the average costs for the 1973 summer program and the 1973-74 academic year program were $63,769 and $51,863, respectively.[19] The weighted costs are seen to be approximately 8 percent less than the corresponding unweighted costs.

The actual dollar amounts for the composite costs are probably inflated. The average total cost is less than the sum of the composite costs within every column of Table 5.18; this suggests that projects with smaller operating budgets did not report total costs. Moreover, the weighted average total costs (which give greater weight to the smaller projects, that were less likely to be selected into the sample and that have smaller budgets) are less than the unweighted average total costs. If one accepts the weighted figures as more accurate, then this also suggests inflated values of the composite cost averages. The major concern regarding composite costs, however, lies not with their absolute value but with their value relative to total costs. This matter will be addressed below under the assumptions that: (1) proportional allocation of resources is, on the average, relatively stable over projects; and (2) the larger projects, which contribute most heavily to the reported composite cost figures, are in fact representative of the population in their allocation of funds. For these computations the sum of the composite costs was used in determination of proportional costs rather than using the Average Total Cost.

For the summer program, personnel costs accounted for $31,409, or 45 percent of the sum of all component costs; nonpersonnel direct costs accounted for $35,528, or 50 percent of the sum; and indirect costs accounted for $3,297, or 5 percent of the sum. In comparison, the unweighted costs for the 1973-74 academic year program were distributed as follows: personnel costs were $34,688, or 51 percent of the sum; nonpersonnel direct costs were $29,224, or 43 percent of the sum; and indirect $4,248, or 6 percent of the sum. For both programs, wages and salaries constituted the largest single expense, followed by payments for room and board and stipends.

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[18] Total unweighted program year average cost is not equal to the sum of the average costs for the summer program and the academic year program, since computations leading to these values were based on different subsets of projects. Summer costs were based on data from 39 projects, academic year costs were based on data from 35 projects, and total year costs were based on data from 35 projects reporting both summer and academic year costs.

[19] The weighted program year average cost is not equal to the sum of the average costs of the two separate program phases. This is because three different regression equations were used in imputing missing values (one each for the summer program, academic year program, and program year).

The data on average costs of UB projects contained in Table 5.18 suggest that the average total costs for the 1973-74 academic year program were comparable to the costs of the 1973 summer program in magnitude. While the summer program is of shorter duration, it is more intense, involving more full-time staff members and often more students. There are also additional expenses incurred during the summer program involving the housing and feeding of UB participants on the host institution campus.[20] The allocation of costs within the two program sessions differs somewhat, primarily in the intuitive increase during the summer program of expenses for room and board for the residential students and for tuition (presumably for summer Bridge students who are taking college credit courses).

As can be seen from Table 5.18, nonfederal funds account, on the average, for a small proportion of project costs. During the 1973 summer program nonfederal funds made up only 8 percent of the sum of federal and nonfederal expenses. During the 1973-74 academic year program, the analogous percent was 11 percent. The average nonfederal values are, however, somewhat misleading. More than half of the responding projects reported no nonfederal funds, while the maximum nonfederal support reported was $175 thousand and $100 thousand for the summer and academic year programs, respectively.

The estimated project costs described above are dollar costs to the projects and exclude the value of in-kind contributions; i.e., resources contributed to the projects, such as office space, facilities, equipment, and administrative, service delivery, and support services, provided free or at a price below value. Unweighted estimates of the value of in-kind contributions, obtained from responses to the PDQ, were $4,084 per project for the summer program and $5,065 per project for the academic year program. The average composition of in-kind contributions by source is shown in Table 5.19. Although the magnitude of the bias is unknown, the estimates of in-kind contributions are believed to be biased downward due to conceptual difficulties of estimating the extent and value of such contributions, and because they were omitted or not valued on many of the questionnaires (and assumed, in these cases, to be zero). However, unless gross bias exists, the value of in-kind contributions is relatively insignificant since the reported values of these contributions constitutes only about 8 percent of the total unweighted average value of funding.

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[20] Although some expenses for room and board were reported for the academic year, these expenses are greater for the summer program (see Table 5.18).

B. Project Cost Differences

Project costs for the 1973 summer program and the 1973-74 academic year program varied widely among the UB projects. The unweighted average total costs per project for the summer program, excluding in-kind contributions, was $69,532, but individual project costs ranged from $9,79[illegible] to $175,000; and the average total cost per project for the academic year was $56,226, but varied from $17,500 to $134,000. To infer from the above data that one type of program was more or less costly than another would be misleading since many factors must be accounted for. Factors which were analyzed for association with the variations in project costs included whether the project was for the summer or academic year, the number of students served by the project, the area or density of the population served by the project, the type of host institution, and project staffing pattern. Project costs were analyzed with respect to these factors to determine the magnitude and direction of their influence. Linear regression analysis[21/] was the primary statistical method employed to measure the degree of association between total project costs and the factors listed above.

[21/] This method generates the equation for a straight line that provides the "best" prediction of some criterion variable from a predictor variable (or set of predictor variables). The square of the correlation between the two variables (R^2) measures the proportion of variance in the criterion variable that may be accounted for by this linear prediction. See Appendix I for a more detailed discussion of regression analysis.

Table 5.19

AVERAGE CONTRIBUTION OF SPONSORING AGENCIES OR INSTITUTIONS TO UPWARD BOUND PROJECTS, 1973-74

	1973 Summer Program	1973-74 Academic Year	Total 1973-74 (Sum of Columns)[a]
Source of Contributions			
Cash	$ 788	$ 881	$ 2,155
In-kind			
Personnel	1,038	2,071	3,059
Facilities	2,068	2,458	4,295
Other	978	536	2,949
Total Contribution[b]	5,216	6,410	12,361

NOTE: Values presented in this table were computed on data from 40 to 43 projects. The average values are unweighted and based only on determinate responses.

[a] Values are not equal to the sum of values in columns 1 and 2 because some projects furnished data only for the total program year and thus do not contribute to the summer or academic year averages.

[b] Total values are not equal to the sum of the components because some projects provided only data for total contribution and thus do not contribute to the component averages.

1. Project Size

In these analyses, a logical causal relationship was inferred (e.g., the total project cost depends upon the number of clients served). Once the linear regression line is determined, one may predict the total project cost based on the value of the causal variable, and a comparison of this predicted number with the actual data provides useful information on the degree to which a project's cost varies from the norm.

Unweighted project costs were analyzed separately for the 1973 summer program and the 1973-74 academic year program as well as for the aggregate total annual project costs. Before project costs were analyzed, the data were adjusted to account for differences in the number of students served in the summer program and the number served during the academic year. For analysis purposes a weighted average number of students served was obtained from the following calculation:

$$\text{Weighted Average} = \left[2\begin{pmatrix}\text{Number of}\\\text{students in}\\\text{summer program}\end{pmatrix} + 9\begin{pmatrix}\text{Number of students}\\\text{in academic year}\\\text{Program}\end{pmatrix}\right] \div 11.$$

A regression analysis of the association between the total yearly cost per project and the average number of students per month in each project confirmed the intuitive conclusion that project costs are positively associated with the number of students served. The equation derived from the regression analysis is:

$$\text{TOTAL ANNUAL PROJECT COST} = \$1{,}722 + \$1{,}499\begin{pmatrix}\text{AVERAGE NUMBER OF}\\\text{STUDENTS PER MONTH}\end{pmatrix}.$$

A statistic derived from the regression equation, the squared correlation coefficient (R^2), indicates that the association is relatively strong; specifically, that 58 percent of the variation in total costs among projects may be explained by the variation in the number of students served by the projects. The regression equation was based on cost data from 34 projects.[22]

A scatter diagram, the "best fit" line from the regression equation, and the 95 percent confidence interval for predicted values of total cost are shown in Figure 5.1. Each point represents, for a single project, the coordinate of the number of students (on the horizontal axis) and the total project costs (on the vertical axis). From the regression line one could predict that the total cost of a project which served 100 students per month would be $151,622, i.e., $1,722 + $1,499 (100).

An analysis of project costs, classified according to summer program costs and academic year costs, yielded a somewhat different perspective of the relationship between project costs and the number of students served. The regression equation for the total project costs allocated to the summer program as a function of the total number of students served in the summer program was:

$$\begin{matrix}\text{TOTAL SUMMER}\\ \text{PROJECT COSTS}\end{matrix} = \$13{,}261 + \$657 \begin{pmatrix}\text{TOTAL NUMBER OF STUDENTS}\\ \text{IN THE SUMMER PROGRAM}\end{pmatrix}$$

This relationship accounted for 46 percent of the variation in the total summer program costs among projects and was based on cost data from 38 projects.

A comparable equation for the relationship between the total academic year program costs and the number of students in each academic year program was also determined. Approximately 49 percent of

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[22] Statistical significance of the regression equations derived will not be presented. Recall that the regression analyses were performed with unweighted data, which assumes equal likelihood of the data points (which was not exactly the case for the current project sample). Moreover, projects with nonresponse to the PDQ or to the cost item could not contribute to the analyses. It is likely that the responding projects were not representative of the total population for this reason. Finally, the sampling plan used was not simple random sampling and a design effect may have been introduced (some calculations performed in analyzing other data for this chapter suggest that the design effect was probably close to 1, however). Assuming equally likely data points, no bias due to nonresponse, and a design effect of 1, statistical tests were performed on the relationships. No relationship which would have occurred more than 1 time in 100 by chance under these assumptions is reported in this chapter.

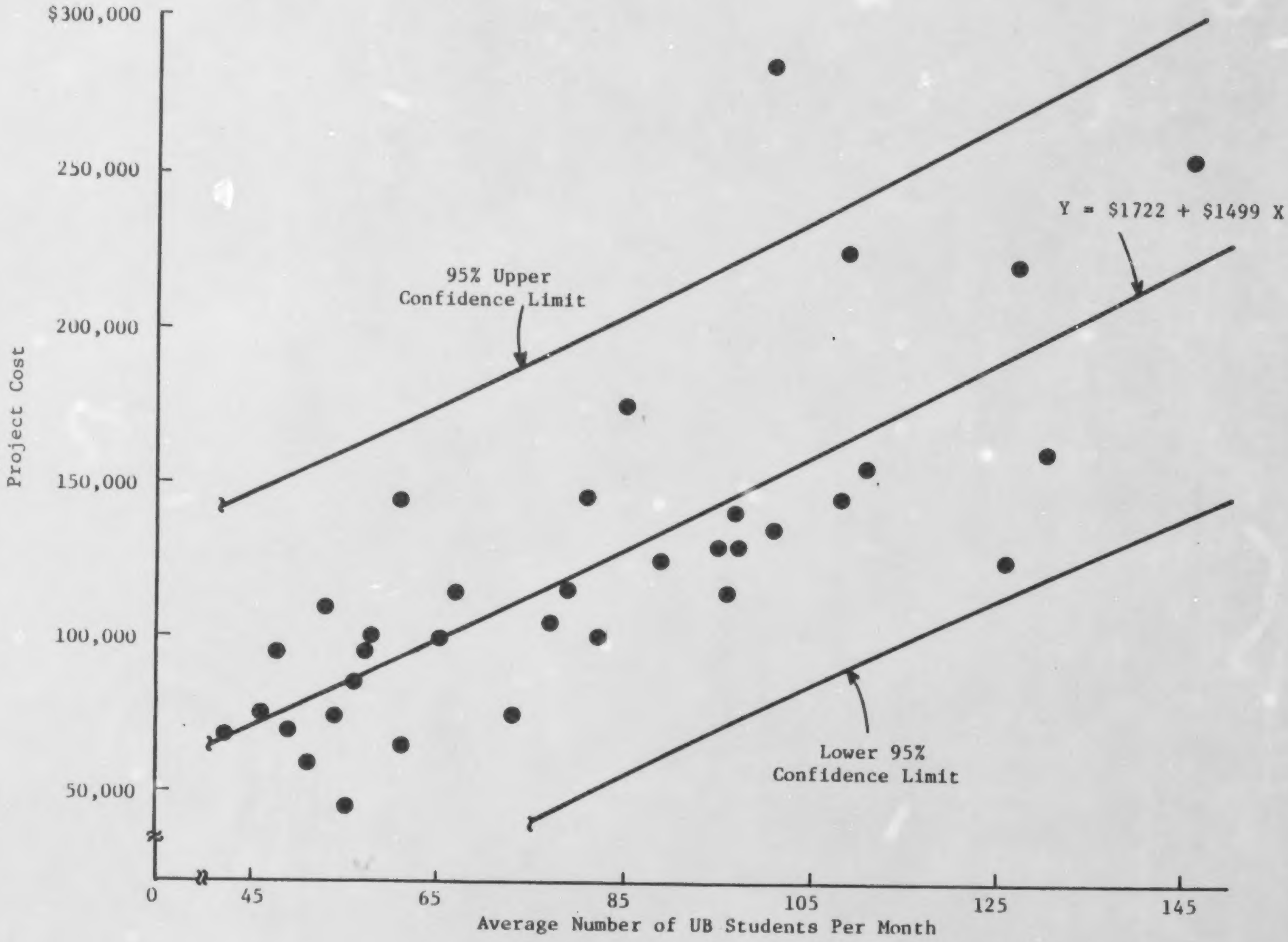

Figure 5.1. Total Year Project Cost as a Function of Average Number of Students Served.

the variation in total project academic year costs was explained by project size. The equation derived from the academic year data was:

$$\begin{array}{l}\text{TOTAL ACADEMIC}\\ \text{YEAR COSTS}\end{array} = -\$598 + \$720\left(\begin{array}{l}\text{TOTAL NUMBER OF STUDENTS IN}\\ \text{THE ACADEMIC YEAR PROGRAM}\end{array}\right)$$

and was based on 34 observations. The regression lines, associated data points, and 95 percent confidence intervals for the summer program and the academic year program are shown in Figures 5.2 and 5.3, respectively.

2. Other Factors

Even though the average number of students served per month appeared to be a good predictor of project costs for the entire program year, factors other than project size certainly influence the level of project fundings and, consequently, project costs. Other factors which were examined for their influence on total project costs were the type of host institution and the relative proximity of the project to its students. Thirty-five of the 48 respondents to the PDQ, whose projects were sponsored by either a public or private educational institution, furnished comparable cost data. Table 5.20 summarizes the average yearly total project costs according to the classification of sponsoring institutions for those 35 projects. The difference in total costs between types of sponsoring institutions is quite small in light of the small sample size and the large standard deviations of the costs.

Another factor considered was whether project costs varied with respect to the geographic location of the majority of its students. Project directors were asked to indicate the percent of their project's students who came from each of 10 location categories. Their responses were then collapsed into three general location categories (based on the location of the majority of its students) as follows: (a) rural or small town, including reservation, rural or farming community, small city or town of fewer than 50,000 people that is not a suburb; (b) medium-sized city or suburb, including medium-sized city (50,000-

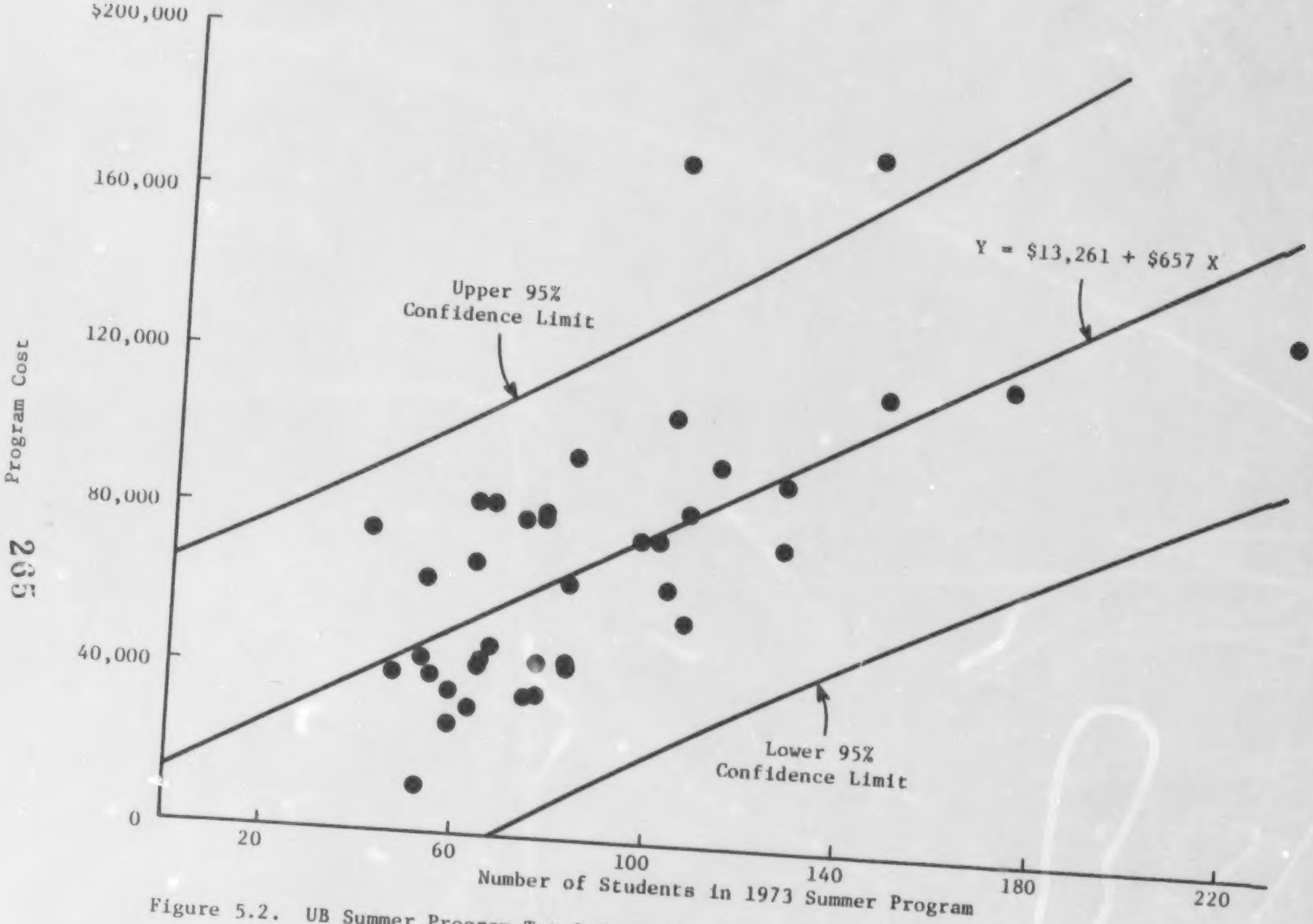

Figure 5.2. UB Summer Program Total Costs as a Function of Number of Students Served.

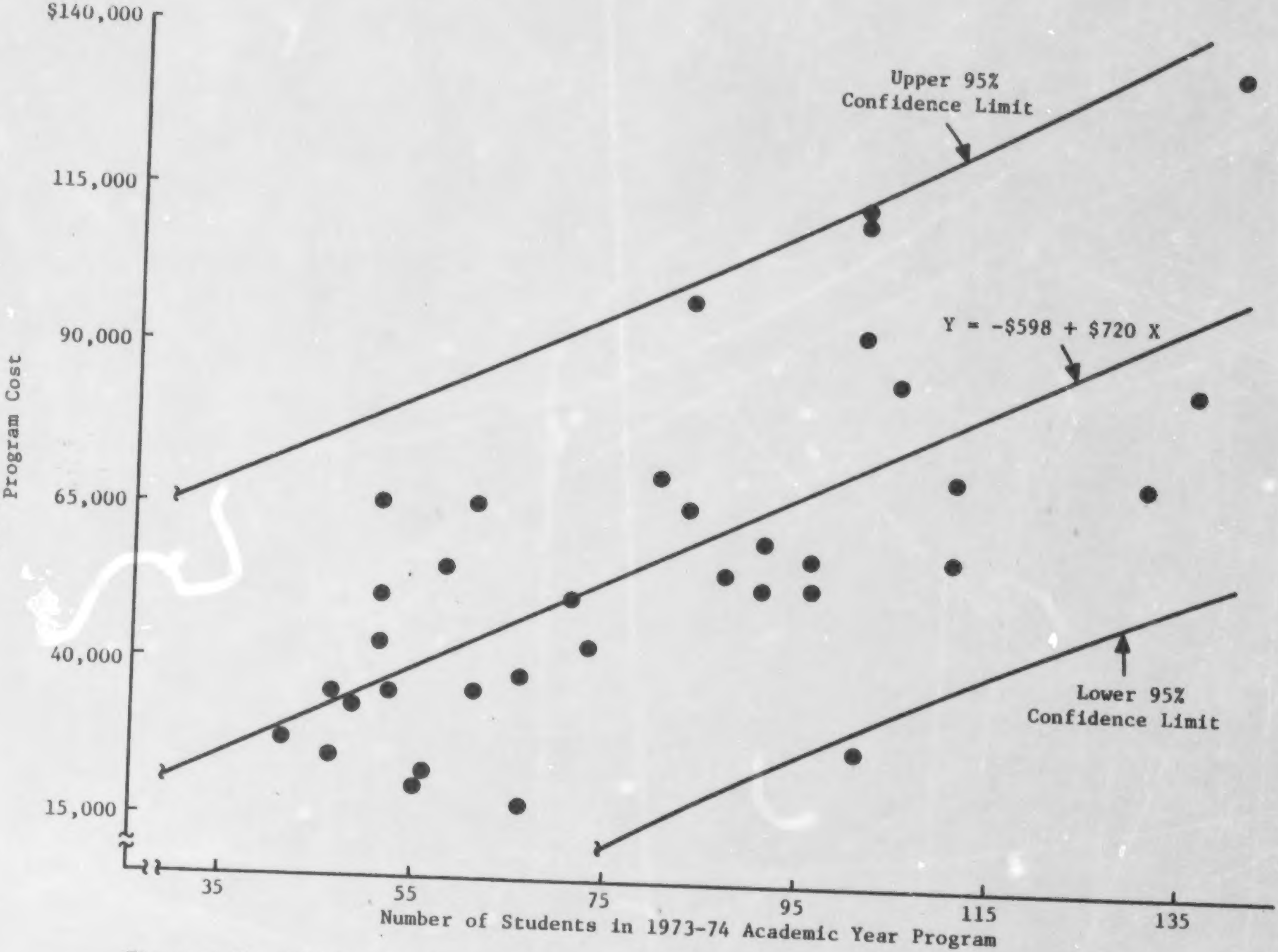

Figure 5.3. UB Academic Year Program Total Costs as a Function of Number of Students Served.

Table 5.20

UB PROJECT TOTAL COSTS CLASSIFIED BY TYPE OF SPONSORING INSTITUTION FOR 1973-74 PROGRAM YEAR

Type of Sponsor	Number of Projects	Project Average Total Cost	Standard Deviation of Project Costs	Coefficient of Variation[a]
Public Educational Institution	22	$124,542	$55,668	.45
Private Educational Institution	13	$118 252	$54,211	.46
Total	35	$122,206	$54,413	.45

NOTE: Statistics reported in ths table result from unweighted calculations with no adjustments for instrument or item nonresponse.

[a] Coefficient of variation is the standard deviation of project costs divided by average total cost.

100,000 people), suburb of a medium-sized city, suburb of a large city, suburb of a very large city; and (c) city with over 100,000 people.

A summary of the unweighted average total project costs for the three categories of project location is given in Table 5.21. The average total costs for projects with a majority of their students from medium-sized cities or suburbs and those for projects with a majority of their students from large cities are quite similar at $148,296 and $137,985, respectively. In comparison, the average total cost of those projects with a majority of their students from small towns or rural areas was $100,891--approximately $40,000 less than projects in the other two categories. Noting that projects in small towns and rural communities tend to serve fewer students than those in larger communities, it is quite possible that project size is contributing to these observed differences. (When project size is controlled, no such locational differences are observed--see subsection IV.C below.) Further, since the range of project costs within each location category was relatively large and the differences in total project costs among location categories were relatively small compared to this variability and the small sample sizes, there is little indication that location of students is an important factor in affecting project costs.

Total project costs for the 1973 summer and 1973-74 academic year programs were also reviewed with respect to staffing characteristics, classification of the host institution by academic level, and proportion of project costs funded by USOE. No associations were found.

3. Summary

The primary conclusion from the analysis of project total costs is that project size is the greatest identifiable determinant of project total costs, and that other variables examined show little or no meaningful relationship to costs after partialling out the effect of project size. Project size is, however, a reliable predictor of total project costs, explaining approximately half of the

Table 5.21

UB PROJECT TOTAL COSTS CLASSIFIED BY LOCATION OF PROJECT STUDENTS

Location	Number of Projects Classified	Project Average Total Cost	Standard Deviation of Project Cost	Coefficient of Variation[a]
Rural or small town	16	$100,891	$34,844	.35
Medium size city or suburb	4	$148,296	$76,217	.51
Cities with over 100,000 people	15	$137,985	$60,533	.44
Total	35	$122,206	$54,413	.45

NOTE: Statisticsl reported in this table result from unweighted calculations with no adjustments for instrument or item nonresponse.

[a] Coefficient of variation is the standard deviation of project costs divided by the average total cost.

total variation in costs among projects (for summer program, academic year program, and total program year). No other variable examined except staff size showed a meaningful association with project costs (since staff size and number of students served are very closely related, these results are not reported). In the next subsection the impact of different factors on project costs will be reconsidered, after adjusting the data to remove the influence of project size.

C. Project Costs Per Student

A positive association between the level of project costs and the number of students participating in a project was expected, since a project receiving extensive financial resources is capable of serving more students. Conversely, a project proposing to serve many students is likely to receive more funding than a small project if for no other reason than to provide for student stipends and the larger staff required.[23] In the preceding subsection, a strong positive association was shown to exist between the total project costs and the number of students served by a project. Other factors of interest are more effectively examined after the cost data have been adjusted to account for the influence attributable to project size. This adjustment was made for the annual total project cost data by dividing the costs by the weighted average number of students served each month, yielding a cost per student measure. Adjustments were made for the 1973 summer program and the 1973-74 academic year program cost data by dividing the total project costs attributable to those programs by the total number of students served in each of those programs. These data then provided the basis for further analysis.

As part of the cost analysis, the project cost per student was analyzed with respect to project size, staffing patterns, type of host institution, and the type or size of the community in which the majority of the project's students are located. However, no meaningful associations were found to exist between project costs per student and any of those project characteristics. For example, the relationship between the level of total yearly project costs per student and the weighted average of the number of students per month served by each project was examined to determine whether economies of scale existed among UB projects. Such economies would be demonstrated if the project costs per student were inversely related to the number of students in each project. Mathematical transformations of the data (natural logarithm), as well as the raw data, were analyzed by linear regression analysis to determine the degree of association which existed. None of the resulting equations were found to explain more than 10 percent of the total variation in total costs per student among projects.

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[23] Proposed number of students to be served is the major determinant in the funding equations used by the USOE Regional Offices.

The unweighted total cost per student served in the summer program averaged \$853 with a standard deviation of \$234. This was comparable to the total cost per student incurred in the academic year program, which averaged \$711 with a standard deviation of \$248. Corresponding weighted estimates were \$830 per student in the summer program and \$700 per student during the academic year. Thus, the program costs per student were nearly identical for weighted and unweighted costs, and the differences existing between program phases was small relative to the standard deviations, considering the small sample size.

VII. PROJECT STAFFING PATTERNS

A characteristic of UB projects which may impact on their capacity and capability to provide services to students is the project staffing pattern. A descriptive profile is presented in Table 5.22.

During the 1973-74 academic year program the project staff averaged 3.4 full-time and 9.3 part-time employees, and the 1973 summer program consisted of 10.2 full-time and 13.0 part-time persons. The average values are misleading, however, because a few projects maintained very large staffs, while most contained relatively small staffs. This does not mean that small projects operated with skeleton staffs, but that the mix of employees, by type of position, varied among projects and that individuals performed multiple functions in projects. It should be noted that the average number of full-time project directors per project was less than one (mean = .8), since the directors of some projects allocated a portion of

Table 5.22

DESCRIPTIVE PROFILE OF UPWARD BOUND PROJECT STAFFING PATTERNS BY SUMMER AND ACADEMIC YEAR PROGRAMS

	Average Number of Persons Employed In:			
	1973 Summer Program		1973-74 Academic Year Program	
Type of Position	Full-time	Part-time	Full-time	Part-time
Project Director	.8	.1	.8	.1
Assistant Project Director	.6	.1	.5	.1
University Instructor	.6	1.6	.0	.7
High School Instructor	1.8	3.3	.2	2.4
Senior Counselor	.5	.5	.3	.2
Tutor/Counselor	3.4	3.4	.4	1.9
Tutor	.4	.7	.0	1.5
Secretary	.8	.2	.7	.2
Volunteers	.1	.7	.2	.7
Other	1.2	2.4	.3	1.5
Total	10.2	13.0	3.4	9.3

NOTE: These results are based on responses from 48 project directors to question 39 of the PDQ. The reported values result from unweighted calculations with no adjustment for instrument nonresponse.

their time to other programs or activities, and were not committed full-time to UB.

To describe the profile of staffing patterns more generally, the 10 staff positions were collapsed into three staff functions: (a) Administrative, including project director and assistant project director; (b) Service Delivery, including university instructor, high school instructor, senior counselor, tutor/counselor, and tutor; and (c) Support, including secretary, volunteer, and other. A summary of the average number of persons employed for each staff function is contained in Table 5.23. From this summary a single measure of project staffing intensity was generated. This measure, the number of full-time equivalent (FTE) employees, was calculated for each project by adding one-half the number of part-time employees to the number of full-time employees.[24] As Table 5.23 illustrates, the number of full-time equivalent employees is similar for the summer and academic year program for administrative and support personnel, but differs significantly for service delivery personnel, due to the intensity of the summer program services. An average of 11.5 FTE persons are employed during the summer program but only 4.3 FTE persons are employed, on the average, during the academic year program.

A question of interest about staffing patterns was whether the proportion of project funds expended for personnel costs was related to the number of students served by a project. To answer this question a regression analysis was performed with the proportion of total costs allocated for personnel as the dependent variable, and the average number of students served per month as the independent variable. As one might expect, the proportion of a project's total costs allocated to personnel expenses is inversely related to project size. The regression equation derived was:

$$\frac{\text{TOTAL PERSONNEL COST}}{\text{TOTAL PROJECT COST}} = .6600 - .0024 \left(\begin{array}{c}\text{AVERAGE NUMBER OF}\\ \text{STUDENTS PER MONTH}\end{array}\right) .$$

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[24] While the calculation used to determine FTE employees is reasonably valid for the summer program, it may provide an artifically inflated value for the academic year program. During the academic year, it is not uncommon for part-time staff members to be employed for less than 8 hours per week (typically an evening during the week or Saturday morning).

Table 5.23

DESCRIPTIVE PROFILE OF UB PROJECT STAFFING FUNCTIONS BY SUMMER AND ACADEMIC YEAR PROGRAMS

	Average Number of Persons Employed In:					
	1973 Summer Program			1973-74 Academic Year Program		
Staff Functions	Full-time	Part-time	Full-time Equivalent[a]	Full-time	Part-time	Full-time Equivalent[a]
Administrative	1.4	.2	1.5	1.3	.2	1.4
Service Delivery	6.7	9.5	11.5	.9	6.7	4.3
Support	2.1	3.1	3.7	1.2	2.4	2.4

NOTE: These results are based on results from 48 projects. The reported values result from unweighted calculations with no adjustment for instrument nonresponse.

[a] Determined as full-time plus one-half part-time.

An economic interpretation of the relationship is that during the 1973-74 program year, a maximum of 66 percent of project expenses were for personnel; but the proportional allocation declined by 2.4 percent for every 10 students added to the project. This interpretation is intuitively reasonable since each functioning project would require a basic complement of administrative personnel regardless of its size. The equation, however, explains only 35 percent of the total variation in the proportion of total project costs allocated to personnel expenses among projects, leaving 65 percent of the variation unexplained.

VIII. SUMMARY

This chapter has described a large number of dimensions of the structure and function of UB projects, using as units of analysis the project as represented by the responses of project directors, instructors, and counselors (responses of instructors and counselors having been aggregated separately within project). Also presented in this chapter were the large bulk of observations made during site visitations to 15 projects. After a general characterization of UB operations, as drawn from site visits, major topics addressed in the chapter were: programmatic characteristics of the projects, including activities offered and project emphases; interpersonal relationships of individuals within the project; project relations with other groups, institutions, and organizations; project costs; and project staffing patterns. A table of generalized standard errors was provided to aid in interpretation of tabular results.

A major finding of both site visits and questionnaire results was that Upward Bound does not appear to represent a single intervention treatment, or even two or three clearly delineated treatments. While most program purposes appeared to be common among the sample of projects visited, and among those returning staff questionnaires, there were many important differences in the implementation of UB, and thus it was not easy to describe even a "typical" project except in the most general terms.

Site visits revealed considerable insight into project operations. Projects differed in their purposes, emphases, and assumptions. While most projects encouraged students to aspire to and prepare for postsecondary education of various sorts, certain projects emphasized personal/social development or completion of high school even to the extent of deemphasizing academic attainment and postsecondary placement. Similarly, some projects left it up to the students' maturity and independence to follow through on academic and other responsibilities in the summer program, while other UB projects managed and supervised the student's every waking moment. It was also found that projects differed with respect to the rationale for selecting or requiring the summer courses students would undertake--as well as the nature and extent of tutoring, counseling, and classwork during the academic-year component. The net result of these variations in purpose and content was that some projects seemed to have somewhat limited programs with respect to the disadvantaged and their academic futures, while other projects appeared to be highly organized and highly confident of their purposes and impacts.

All visited projects engaged in active recruitment of UB prospects, usually with the considerable assistance of contact counselors at feeder high schools. There appeared to be little difficulty or disparity in applying the low-income guidelines in the selection of UB candidates, but in interpretation of "academic risks," difficulties of definition were encountered and various procedures were subsequently employed. Project staff relied on grades, grade averages, aptitude test scores, teacher or counselor recommendations, evidences of student motivation (or lack of motivation), and personal intuition in selecting UB students.

Once students were formally enrolled, they had considerably different programs organized for them, depending upon the particular project. Within the academic-year component (regardless of number of years involved in the program), the students might find their program to consist of irregular contact comprised mostly of counseling, or find a series of weekly meetings involving counseling, tutoring, and formalized classes. They might be in touch with only the permanent project staff--or might also have contact with counselors, tutors, instructors, or special lecturers and career educators. They might spend considerable time in applying for college admission and financial aid, or they might have only a tangential touch with that process.

Summer programs were much more likely to fit a common mold: six weeks of formal classes, recreation, tutoring, cultural activities, and exposure to the wider world of the host institution. At the same time, there were important differences: some projects offered course options to students while others did not; some programs appeared to be considerably more structured than others; in some cases, students took weekend trips to other campuses or had other planned experiences away from the campus, but elsewhere this opportunity was not provided; and the student might or might not have a college instructor as a teacher. Perhaps the most important variation had to do with the Bridge component, the special arrangement made for those who had just been graduated from high school. Several projects did not have such a Bridge program, and thus a fair proportion of otherwise eligible students did not have either college courses, contact with college instructors, or the possibility of earning college credit.

In both summer and academic year sessions, counseling and tutoring were offered by all projects, but the availability of remedial, college preparatory, elective, and study skills courses varied more widely across projects and between sessions. Except for study skills, the courses were more likely to be offered in the 1973 summer session and dropped in the following academic year program. Corresponding to the universal availability of tutoring and counseling across projects and sessions, tutoring or remedial instruction and counseling were seen by all three staff groups as being by far the most emphasized functions in their project during both the 1973 summer and 1973-74 academic year programs. Cultural enrichment was generally perceived by the staff as the third most emphasized function in the summer session, while liaison work with school and community representatives replaced it as the third most emphasized function in the academic year session.

Relationships within and between project staff members and students appeared to be generally very good, as reported in questionnaires and as observed during site visits. The questionnaire results did appear to paint a more favorable picture than was supported by site visit observations. While face-to-face interviews conducted during site visits did reveal some few projects in which intraproject communication and cooperation were strongly criticized, such negative evaluations were noticably lacking in the questionnaire reports. At every project visited, however, there seemed to be a high degree of camaraderie among students and a particular loyalty by the students to the project and its staff, as mirrored in the questionnaire reports.

The relationships of the project to external groups and organizations were also examined. One of the most important external agencies was the postsecondary institution hosting the project. There appeared to be many evidences of a considerable commitment by the host institutions to the UB concept and the particular project. For example, most institutions gave faculty or administrative status to project directors, many included their regular instructors in the summer program, and virtually all provided the program and facilities of the institution on an equal basis for both UB students and regular students on that campus. In addition, there were many indications of financial support of the project to a greater or lesser degree, and in most cases the institution supported other programs of assistance to minority disadvantaged youth along with the Upward Bound project.

By and large, projects reported maintaining good to excellent relationships with the feeder high schools. In particular, many high schools allowed credit for makeup or advanced work, provided the services of a "contact counselor" as a liaison with UB, and encouraged UB staff to recruit in the schools. The projects also reported good to excellent relationships with postsecondary institutions, other than the host institution.

Communications with the USOE regional office were generally less satisfactory than that with host institutions or high schools. In particular, many projects reported during site visits the need for more assistance, monitoring, feedback, and direction than they were receiving, and some project staff noted that a number of important decisions appeared to be made unilaterally at the regional office level.

The majority of host institutions also administered other programs for the disadvantaged, and, in general, the project directors reported cooperation with these programs. Additionally, project directors reported cooperation with other programs for disadvantaged youth which operated in the area.

Relationships with the community, through the various UB project advisory committees, or otherwise, were reported to be good. Individuals and groups in the community were reported to offer good suggestions to many of the projects, and the general level of support of these groups in performing a variety of UB functions was rated to be good.

Cost and staffing pattern profiles were developed and an examination of the degree of association existing between those factors and other UB project characteristics was conducted. The analysis of the sources and uses of funds provided a descriptive profile of the financial characteristics of UB projects. The weighted average total cost per project (excluding in-kind contributions) was $111,986 for the 1973-74 program year. For the 1973 summer program, the weighted average project cost was found to be $63,769 or $830 per student served; for the 1973-74 academic year program average cost was $51,863 or $700 per student served. Federal sources contributed well over 90 percent of the funding necessary to support the UB projects. Additionally, an average of $9,149 worth of in-kind contributions such as office space, facilities, equipment, and personnel services, were received by the projects. There was considerable variability of the cost figures, particularly in the area of nonfederal support, which ranged from values of $0 to well over $100 thousand, with the preponderance of projects reporting no nonfederal funding.

Project costs were examined with respect to the number of students served, the location of the majority of students served, and personnel staffing patterns. The only one of those factors found to be meaningfully associated with total project costs was the number of students served by a project. About half of the variation of total costs among projects could be explained by the variation in the number of students served by the projects. This proportion of explained variance was relatively constant, whether considering the total program year, the academic year program, or the summer program.

To analyze any additional impact of other factors, the cost data were adjusted to account for the influence attributable to the number of students in projects. The adjusted cost data, representing cost per student, were then analyzed with respect to the other factors. No meaningful associations were found to exist between the adjusted cost data and any other project characteristics considered.

Project staffing patterns were described and analyzed to determine whether a degree of association existed between project staffing patterns and other project characteristics. On the average, projects carried about 1.5 FTE administrative employees and approximately 3 FTE support employees throughout the year but the number of FTE employees delivering UB services varied from 4.3 during the academic year to 11.5 during the summer programs. There was, however, considerable variation about the average project staffing profile. No associations were found to exist between project staffing patterns and other project characteristics.

Chapter 6

Perceptions of the Upward Bound Program by Participating Students

I. GENERAL

This chapter presents UB students' reports of their activities in UB, their perceptions of the usefulness of these activities, their reports of the benefits they have derived from participating in UB, and their evaluation of various aspects of the program. For several reasons, these data are potentially quite valuable. The UB participants are uniquely able to provide a necessary perspective of the program--the perspective of the persons for whom the program was planned and executed. Furthermore, the participants can directly testify to the benefits they have gained from the UB program, as well as to the disappointments they have experienced.

The UB program as described in previous chapters has primarily reflected the perceptions of the persons who executed the program, and who would be expected to have different points of view and insights other than those of the participants. The UB student perceptions of the program, presented in this chapter, are based on reports of those who completed the BSQ. This subgroup of the UB student sample is not representative of the total UB sample and also not completely representative of UB students eligible for the BSQ (see Chapter 3, section VI). Those UB students in the original sample who had dropped out of UB by the spring of 1974 did not fill out the BSQ. BSQ data were also not available for those who remained in the program but who, for whatever reasons, were absent from the various questionnaire administrations. Thus the responding group is self-selected, representing students who had continued to participate in UB and who were willing to complete the questionnaire. Although the UB students being described in this section do not represent the entire population of UB participants, their perceptions of the UB program are presented because only the BSQ respondents were asked detailed questions about the nature of their UB participation and their opinions of various aspects of the program.

To facilitate presentation of results, the population of UB students to which the results of this section generalize will be referred to as "UB students." It should be kept in mind, however, that this population is not the entire UB participant population as defined by the sample. Rather the population being described is a subset of the entire UB participant population, and consists only of those UB participants who would have completed the BSQ. Though not directly testable, it seems likely that the BSQ respondents, as a group, may perceive the UB program in a more favorable light than the nonresponding or ineligible groups.

The format of the tables presented in this chapter differs from that of the tables in previous chapters, which were based on UB staff questionnaires. Because of the relatively small numbers of staff respondents, the staff tables presented both the weighted and unweighted numbers of cases for each cell of each table, so that the reader would be able to judge the credibility of the results based on the number of respondents involved.[1/] The number of UB respondents to the BSQ is sufficiently large, however, to allow presentation of only the total numbers of respondents and total sampling weights. Any cell containing fewer than 20 respondents will be identified by an asterisk. The generalized standard errors to be used for the percentages reported in this chapter and an example of how to use them are given in Table 6.1.

II. EXTENT OF PROGRAM PARTICIPATION

The extent of the UB students' participation in the program is seen as an aid in interpreting their perception of the program. For this reason appropriate items were included in the BSQ, and responses to these items will be presented in this section.

Table 6.2 presents the percentage distribution, by grade in school, of the UB students in terms of the number of summer and academic year UB

[1/] The magnitude of the sampling error of percents is dependent on the number of respondents to an item (the denominator of a percent) as well as the number in a cell (the numerator). Because of unequal weighting and nonresponse adjustments, a few respondents could represent a great many. Thus, when a cell contains only a few respondents, the statistic based on it warrants greater care in interpretation.

Table 6.1

APPROXIMATE STANDARD ERRORS OF ESTIMATED PERCENTAGES FOR CHAPTER 6

Row	Estimated Percentage	Estimated Standard Error (in percentage points)			
		A	B	C	D
1	5 or 95	0.5	0.8	1.1	1.4
2	10 or 90	0.7	1.1	1.6	2.0
3	15 or 85	0.9	1.3	1.9	2.3
4	20 or 80	1.0	1.5	2.1	2.6
5	25 or 75	1.1	1.6	2.3	2.8
6	30 or 70	1.1	1.7	2.4	3.0
7	35 or 65	1.2	1.8	2.5	3.1
8	40 or 60	1.2	1.9	2.6	3.2
9	45 or 55	1.2	1.9	2.6	3.3
10	50	1.2	1.9	2.6	3.3

NOTE: This table contains estimates of approximate standard errors applicable to the majority of estimated percentages contained in Chapter 6. The table was constructed to provide a general order of magnitude of the standard errors of estimated percentages, and is based on the results of a number of different standard error calculations. The formulas and procedures used in these calculations are detailed in Appendix B.

To use the table to determine the approximate standard error for an estimated percentage, first identify the appropriate row and column to use. Select the row that most nearly corresponds to the value of the estimated percentage. Row 1 would be used for estimated percentages near 5 or 95 percent, row 2 for estimated percentages near 10 or 90 percent, etc. Then select the applicable column:

Column A - For Tables 6.3, 6.6, 6.7, and 6.9.
Column B - For Table 6.8.
Column C - For Table 6.4.
Column D - For Table 6.2 and 6.5.

For example, to determine the approximate standard error of an estimated 2.5 percent found in Table 6.3, one would first identify row 1 as the appropriate row. Row 1 is selected because 2.5 percent is closer to the 5 percent of row 1 than to any of the other percentages listed in the table. Column A is selected as the appropriate column, because the estimated percentage was from Table 6.3. Using row 1 and column A, the approximate standard error is found to be 0.5 percentage points.

Table 6.2

NUMBER OF UPWARD BOUND SESSIONS IN WHICH STUDENTS HAD PARTICIPATED, BY HS GRADE LEVEL

Number of Sessions[a]		Grade Level[b]		
Summer and	Academic Year	10th	11th	12th
0	1	11.3	12.4	5.3
0	2 or more	0.8*	0.9*	1.3*
1	0	7.4	7.3	3.9
1	1	36.1	36.6	20.8
1	2 or more	4.5*	6.4	12.9
2	0 to 1	0.2*	1.1*	3.6
2	2	1.6*	4.7	17.1
2	3 or more	0.8*	0.9*	5.3
3 or more	any	0.2*	1.2*	6.8
Indeterminate[c]		37.0	28.5	23.0
Total Percent[d]		100.0	100.0	100.0
Total N (weighted)		2816	7551	8394
Total N (unweighted)[e]		413	1093	1193

NOTE: Table based on responses to BSQ question 52. An asterisk (*) indicates less than 20 cases (unweighted). For approximate standard errors, refer to Table 6.1, column D.

[a] Because students were asked how many sessions they had "taken part in," all students should have responded with at least 1 academic year session, since the BSQ was administered in spring 1974. Some students may have interpreted the question as requiring the number of sessions completed, since some answered "0" academic year sessions.

[b] Of all the students surveyed, 32 (238 weighted) could not be classified as to their grade level. Percentages are based on weighted responses, adjusted for instrument nonresponse.

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Percentages may not total to 100 due to rounding error.

[e] These numbers do not include instrument nonrespondents.

sessions they had attended through spring 1974. As seen in the table, the rate of indeterminate response was unusually high.[2/] The high nonresponse rate obscures the meaning of the results, since the nonresponding group was probably selective. In general, however, the results indicate that the students in the higher grades reported having participated in more sessions, but the increase in extent of participation with grade level was not as great as might be expected. This result may be partly caused by memory error and nonresponse bias, but it may also reflect an underrepresentation among twelfth graders of those who had participated in UB for an extended time, since, as reported in site visits, such students tended to drop out of UB during their senior year in order to work.

The results presented in Chapter 3, Table 3.9 shed additional light on this matter. From that table it can be seen that the median length of time of UB participation among the UB students responding to the BSQ was less than one year at the time they completed the questionnaires. Thus the perceptions presented in this chapter are based on the responses of a group in which at least half of the students had less than one year's experience as members of a UB project.

III. FIRST SOURCE OF INFORMATION ABOUT UB

The source from which UB students first hear about the program has relevance for program recruiting. A question of the BSQ asked students to identify the source of this first information about the program.

The UB students reported first hearing of UB from a variety of sources, as seen in Table 6.3. The source most frequently cited (by 30 percent) was other UB students, followed closely by school guidance counselors (24 percent). UB staff members (11 percent) and school teachers (7 percent) were less frequently cited, although they might be intuitively expected to be logical first sources of information about UB.

These results are consistent with information about the recruiting function of the projects obtained during site visits. Some student

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[2/] The students were required to answer both the number of summer and academic year sessions for the response to be determinate.

Table 6.3

STUDENTS' FIRST SOURCE OF INFORMATION ABOUT UPWARD BOUND

First Source	Percentage[a]
An Upward Bound student	29.7
Other students	7.3
Upward Bound staff member	11.2
School teacher	6.9
School guidance counselor	24.2
Principal or assistant principal	1.2
Minister, priest, or rabbi	0.0*
Parents	2.5
Other relative	7.3
Notice in school	1.8
Pamphlet, newspaper, or magazine	0.2*
Other	1.2
Indeterminate[b]	6.4
Total percent[c]	100.0
Total N (weighted)	18,999
Total N (unweighted)[d]	2,763

NOTE: Table based on responses to BSQ question 51. An asterisk (*) indicates less than 20 (unweighted) cases. For approximate standard errors, refer to Table 6.1, Column A.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[c] Percentages may not total to 100 due to rounding error.

[d] Numbers do not include instrument nonrespondents.

recruitment was carried out in most of the visited projects by a "contact counselor" in the feeder high schools. That counselor typically forwarded names to the UB staff, and often helped students to complete the UB application form and other materials. Moreover, the enthusiasm expressed by the UB participants at most visited sites made them natural recruiters for the program. On-site student interviews with UB students were equally indicative of the value of UB students as program recruiters, but the extent of their involvement in this activity appeared to be a function of their enthusiasm for the program, which varied from project to project.

IV. PARTICIPATION IN AND EVALUATION OF UB ACTIVITIES

A wide variety of activities may be offered by a given UB project--different kinds and levels of classes, different forms of counseling, different approaches to provision of tutoring, etc. An examination of the diversity of offerings of different activities has been presented in Chapter 5 from the point of view of the project director; however, the availability of an activity at a project does not insure that large proportions of students will participate in the activity, nor does it necessarily insure that those students who do participate in the activity will be helped. This section will, therefore, examine the reported rate of participation in various program activities on the part of UB students, and evaluations of the helpfulness of those activities by participating students.

A. Availability of and Participation in UB Activities

Table 6.4 presents the UB students' reports of the availability of specified UB activities and the rates at which they reported participation in these activities.[3] The first column of the table shows the percentages

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[3] Although the list of activities presented is the same as that provided in Table 5.2, comparisons between the two tables is not recommended since the values given in Chapter 5 are estimates of proportion of projects reporting availability of the activities and the values presented in this chpater are estimates of the proportion of students to whom the activities are available. Availability of an activity at only a few large projects could make an activity available to a relatively large number of students.

Table 6.4

AVAILABILITY OF ACTIVITIES TO STUDENTS AND RATES OF THEIR PARTICIPATION

Type of Activity	Percentage[a] of Students				
	Activity Not Available	Activity Available but did not Participate	Activity Participated In	Indeterminate[b]	Total[c]
COURSES					
1. Courses in improving reading	10.0	18.7	65.7	5.6	100.0
2. Remedial English courses	12.5	18.7	61.1	7.7	100.0
3. Other English courses	12.1	22.9	57.2	7.8	100.0
4. Remedial Mathematics courses	10.9	20.6	57.6	10.9	100.0
5. Other Mathematics courses	13.3	17.7	59.8	9.3	100.0
6. Courses on heritage of minority groups	30.8	19.3	38.6	11.3	100.0
7. Social Sciences courses	22.7	20.3	47.8	9.3	100.0
8. Foreign Language courses	43.6	23.3	23.2	9.0	100.0
9. Music courses	36.2	30.3	24.9	8.7	100.0
10. Art courses	21.2	33.4	36.0	9.4	100.0
11. Special interest courses (such as photography, hot rod, etc.)	31.6	28.8	30.2	9.4	100.0
12. Classes in preparing for college examinations (such as SAT or ACT)	29.8	18.6	42.8	8.8	100.0
13. Classes in learning how to study	38.5	12.0	40.8	8.7	100.0
14. Courses taught in two languages	65.8	12.4	12.5	9.2	100.0
15. Classes on how to take tests	51.3	10.4	29.8	8.5	100.0
TUTORING					
16. Tutoring by professional teachers and counselors	17.3	15.4	56.3	11.0	100.0
17. Tutoring by college students	17.1	14.6	58.2	10.3	100.0
18. Tutoring by other students in the program	34.2	16.2	37.4	12.3	100.0
19. Tutoring by others	32.8	15.4	39.2	12.7	100.0
COUNSELING AND OTHER HELP					
20. Individual counseling on personal problems	23.6	23.5	46.3	6.5	100.C
21. Counseling on vocation or career best suited to your abilities and interest	19.6	16.5	56.9	7.1	100.0
22. Counseling on academic problems	17.0	16.8	56.3	9.9	100.0
23. Visits on one or more colleges or other schools	20.2	14.3	53.8	11.6	100.0
24. Information and counseling about requirements, costs and financial aid for colleges or other types of schools	12.0	16.4	63.7	7.9	100.0
25. Help in choosing a college or vocational, technical school	13.7	20.5	58.0	7.8	100.0
26. Help in applying to colleges or vocational, technical schools	13.0	24.9	54.2	8.0	100.0
27. Help in applying for financial aid	12.6	24.1	55.3	8.1	100.0
28. Help in finding jobs	36.7	20.2	35.0	8.1	100.0
OTHER ACTIVITIES AND SERVICES					
29. Sports	8.8	17.3	65.9	7.9	100.0
30. Social gatherings	6.3	8.1	76.9	8.7	100.0
31. Cultural activities	5.7	6.6	78.4	9.3	100.0
32. Medical and dental services	21.1	16.0	54.4	8.8	100.0

NOTE: Table based on responses to BSQ question 55. For approximate standard errors, refer to Table 6.1, Column C.

a/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

b/ This represents primarily item response, but also includes multiple, out-of-range, and inconsistent responses.

c/ Percentages may not total to 100 due to rounding error. The total percentage of 100 in each row is based on a weighted N of 18,999, or unweighted N of 2,763 (not including instrument nonrespondents).

of UB students who stated that the given activity was never available to them at any time in their UB participation. The second column shows the proportion of UB students who reported that they had not participated in an activity although it had been available. The third column presents the percentages of students reported they had taken part in the given activity.

It can be seen that, among the various courses listed, such basic subjects as reading, remedial English, English, remedial mathematics, and mathematics were reported as having been commonly available, with only 10 to 13 percent of the students reporting unavailability. (It cannot be assumed, however, that all of the remaining students did have access to such courses, since 6 to 11 percent of the students failed to answer or gave unusable answers for these activities. The indeterminate response rate for an item must be taken into account in interpreting the percentages reported for all other activities as well.) Large proportions of students (57 to 66 percent) responded that they had participated in such courses, and approximately 20 percent said that whereas these courses had been available, they had not taken them. These nonparticipants may represent students who did not need such instruction, those whose other needs were more paramount, or those who had not been with the program long enough to have participated.

As expected, the availability of, and participation rates in, the remaining courses were less and showed greater variation than the basic courses. From 21 to 66 percent of the students reported that the other listed courses had been unavailable. From 10 to 33 percent reportedly had access to such courses but had not enrolled, and from 13 to 48 percent had taken them. The type of course most commonly reported as having been unavailable, and participated in least frequently when available, was "courses taught in two languages." This result is expected, since only projects including students from non-English speaking backgrounds would have reason to offer such courses, and when offered only such students in the project would have reason to attend.

Tutoring by professionals and by college students (probably tutor-counselors for the most part) was reported not available by 17 percent of the students. Some 15 percent of the students had access to such tutoring but had not participated, and about another 57 percent had received such tutoring. Tutoring by others, including other UB students, was less commonly available and fewer students reported having participated.

Personal, vocational, and academic counseling, as well as help in areas related to postsecondary entry were reported as unavailable by 12 to 24 percent of the students. From 14 to 25 percent reported that such help had been available but had not been used. Participation rates for such activities were from 47 to 64 percent. Help in finding jobs was less common, with about a third of the students reporting unavailability and another third reporting participation.

Sports, social gatherings, and cultural activities were the activities least frequently reported as unavailable (6 to 9 percent). Seven to 17 percent reportedly had found these activities available but had not taken part. From 66 to 78 percent of the students indicated they had participated in such activities--participation rates that are even higher than the rates for the basic courses, tutoring, or counseling. Medical and dental services were reportedly unavailable to 21 percent of the UB students; 16 percent reported access but not use; and 54 percent had received such services.

In summary, UB students reported the common availability of and participation in such activities as basic courses in reading, English, and mathematics; tutoring; counseling; and athletic, social and cultural functions. This is consistent with reports by the staff (Chapter 5) that tutoring, remedial instruction, counseling, and cultural enrichment were among the most emphasized functions of the UB projects. Observations of the general availability of these activities were also made during the site visits.

B. Perceived Helpfulness of Activities

The UB students were asked not only to indicate whether they had participated in the specified activities, but also to rate the helpfulness of the activities in which they had taken part. The results of these ratings are presented in Table 6.5. The statistics presented in Table 6.5 were computed only for those students who reported participating in a given activity. The table gives the percentage distribution of students by their

Table 6.5

RATINGS OF HELPFULNESS OF UPWARD BOUND ACTIVITIES BY PARTICIPATING STUDENTS

Type of Activity	Percentage[a] of Participating Students Evaluation of Activity				Total Number of Cases		Median Rating[d]	Mean Rating[d]	Standard Error of Mean Rating
	"Of Little or No Help to me"	"Helped me Somewhat"	"Helped me a lot"	Total %[b]	WN	N[c]			
COURSES									
1. Courses in improving reading	7.5	49.8	42.6	100.0	12467	1822	2.35	2.35	0.03
2. Remedial English courses	10.9	51.8	37.3	100.0	11609	1711	2.26	2.26	0.03
3. Other English courses	11.6	45.2	43.1	100.0	10863	1565	2.33	2.32	0.02
4. Remedial Mathematics courses	11.7	47.6	40.7	100.0	10950	1606	2.30	2.29	0.02
5. Other Mathematics courses	11.4	44.6	44.0	100.0	11356	1683	2.37	2.33	0.03
6. Courses on heritage of minority groups	16.9	44.8	38.3	100.0	7333	1038	2.24	2.21	0.03
7. Social Sciences courses	16.0	49.2	34.8	100.0	9081	1288	2.19	2.19	0.04
8. Foreign Language courses	21.1	47.4	31.5	100.0	4588	685	2.06	2.06	0.04
9. Music courses	24.5	45.8	29.7	100.0	4721	692	2.06	2.05	0.03
10. Art courses	24.7	45.3	30.0	100.0	6334	948	2.06	2.05	0.03
11. Special interest courses (such as photography, hot rod, etc.)	16.2	41.4	42.4	100.0	5745	820	2.32	2.26	0.04
12. Classes in preparing for college examinations (such as SAT or ACT)	10.5	40.6	48.8	100.0	8137	1191	2.47	2.38	0.04
13. Classes in learning how to study	17.2	43.6	39.2	100.0	7758	1133	2.25	2.22	0.04
14. Courses taught in two languages	32.0	40.0	28.0	100.0	2380	354	1.95	1.96	0.06
15. Classes on how to take tests	15.4	44.6	39.9	100.0	5646	844	2.28	2.25	0.04
TUTORING									
16. Tutoring by professional teachers and counselors	8.3	41.7	49.9	100.0	10710	1573	2.50	2.42	0.03
17. Tutoring by college students	12.4	48.0	39.6	100.0	11022	1580	2.28	2.27	0.03
18. Tutoring by other students in the program	26.7	49.5	23.8	100.0	7008	1038	1.97	1.97	0.03
19. Tutoring by others	22.2	50.2	27.5	100.0	7432	1080	2.05	2.05	0.03
COUNSELING AND OTHER HELP									
20. Individual counseling on personal problems	19.0	45.8	35.2	100.0	8812	1266	2.78	2.16	0.03
21. Counseling on vocation or career best suited to your abilities and interest	16.9	48.3	34.8	100.0	10789	1575	2.19	2.18	0.04
22. Counseling on academic problems	15.8	48.7	35.5	100.0	10689	1564	2.20	2.20	0.04
23. Visits on one or more colleges or other schools	13.0	41.6	45.3	100.0	10236	1478	2.39	2.32	0.04
24. Information and counseling about requirements, costs, and financial aid for colleges or other types of schools	10.4	41.6	48.0	100.0	12114	1767	2.45	2.38	0.03
25. Help in choosing a college or vocational, technical school	15.3	41.9	42.8	100.0	11010	1621	2.33	2.27	0.04
26. Help in applying to colleges or vocational, technical school	13.8	35.0	51.1	100.0	10280	1505	2.52	2.37	0.03
27. Help in applying for financial aid	11.2	32.9	55.9	100.0	10500	1529	2.61	2.45	0.03
28. Help in finding jobs	32.9	38.3	28.9	100.0	8560	1239	1.95	1.96	0.04
OTHER ACTIVITIES AND SERVICES									
29. Sports	13.5	42.8	43.7	100.0	12528	1798	2.35	2.30	0.02
30. Social gatherings	13.4	45.0	41.6	100.0	14567	2113	2.31	2.28	0.03
31. Cultural activities	9.6	36.9	53.6	100.0	14892	2155	2.57	2.44	0.02
32. Medical and dental services	17.5	37.1	45.0	100.0	10289	1477	2.37	2.28	0.05

NOTE: Table based on responses to BSQ 55. For approximate standard errors of percents, refer to Table 6.1, Column D. The statistics reported in this table were computed only for that subset of students who indicated they had participated in a given activity.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] Percentages may not total to 100 due to rounding error.

[c] Numbers exclude instrument nonrespondents and respondents who reported not having participated in each activity.

[d] Median and mean ratings are based on a scale of 1 ("of little or no help") to 3 ("helped me a lot"), and are computed for determinate responses only, without adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, or inconsistent responses).

ratings of each activity from little help to much help as well as the mean and median ratings (based on a scale of 1 for little help to 3 for much help).

The majority of students who had participated in given activities were fairly positive about the help received. At least two-thirds of the participating students reported each activity to be at least somewhat helpful (i.e., gave a rating of 2 or higher). For each listed activity, however, some students (8 to 33 percent reported little or no help as a result of their participation. The three activities which were rated the least helpful (receiving the lowest mean ratings, of 1.96 or 1.97, and being rated as of little or no help by 27 to 33 percent of the students) were courses taught in two languages, tutoring by other students in the program, and help in finding jobs. All three activities were also characterized by relatively low participation and availability rates, as previously shown in Table 6.4.

The activities reported as most helpful by the participating students were tutoring by professional teachers and counselors, help in applying for financial aid, and cultural activities. Each of these three activities was rated by over half the participating students as having helped considerably and received a mean rating of from 2.42 to 2.45.

Among the 15 types of courses and classes listed, the 5 basic courses (items 1 through 5), classes on taking tests, and classes in preparing for college examinations were reported as being more helpful than the remaining courses (which are less basic academic courses or special interest courses). These results suggest that the UB courses in basic subjects and test skills were more appreciated by participating students than the other, less basic courses. However, from 8 to 12 percent of the participating students reported that the basic courses were of little or no help.

Among the tutoring activities, tutoring by professional teachers and counselors was rated the most helpful (mean rating of 2.42) by participating students. From 8 to 27 percent of these students reported the various tutoring activities as of little or no help, with tutoring by other students in the program seem as least helpful.

The three types of counseling listed were all reported as being moderately helpful (mean ratings of 2.16 to 2.20), and activities related to information and application for college entry and financial aid were all rated somewhat higher (from 2.27 to 2.45). Consonant with the impression gained in the site visits in this area, relatively little emphasis was placed on the choice of an appropriate school, this activity was perceived as the least helpful of the postsecondary preparatory activities. From 10 to 19 percent of the participating students found the counseling and postsecondary preparation activities as being of little or no help.

One of the "Other Activities and Services", cultural activities, was rated as being among the most helpful of all activities (mean rating of 2.44). The other activities in this category were also seen as helpful (mean ratings of 2.28 to 2.30). Only 10 to 18 percent of participating students stated that these activities were of little or no help.

In summary, the activities reported by UB students as being readily available and having high participation rates (i.e., basic courses, tutoring, counseling, activities related to entry into postsecondary education, and such cultural enrichment activities as sports, social gatherings, and cultural events) were also the courses and activities that participating students rated as most helpful. As specified previously, these were the areas that UB staff members reported as the most emphasized functions of their projects.

V. EVALUATION OF ASPECTS OF PROGRAM OPERATIONS IN THE 1973-74 PROGRAM YEAR

Table 6.6 presents the evaluation of various aspects of program operations during the summer of 1973, made by those UB students who reported having participated in that session (about 84 percent of the UB students). The topics evaluated included the content of curriculum, quality of administration, and staff and student interrelationships. The table presents the percentages of students who rated each item on a five-point scale of "poor" to "excellent" or who answered that the item was not applicable. The table also shows the median and mean ratings based on this scale of 1

Table 6.6

STUDENTS' EVALUATION OF VARIOUS ASPECTS OF THE 1973 SUMMER PROGRAM

Program Element	Percentage[a/] of Students								Median Rating[e/]	Mean Rating[e/]	Standard Error of Mean Rating
	Poor	Fair	Don't Know	Good	Excellent	Doesn't Apply[b/]	Indeterminate[c/]	Total[d/]			
1. Content of curriculum	1.8	14.2	6.1	47.5	21.3	1.3	8.0	100.0	3.99	3.80	0.04
2. Quality of tutoring	1.6	15.1	4.1	41.1	27.6	3.2	7.5	100.0	4.08	3.87	0.06
3. Quality of counseling	1.9	12.5	2.5	39.6	34.3	1.7	7.7	100.0	4.22	4.01	0.05
4. Overall administration of program	1.1	12.0	4.4	38.4	35.4	0.9	7.7	100.0	4.23	4.04	0.06
5. Discipline by staff	2.8	14.8	2.8	43.8	26.9	1.2	7.8	100.0	4.07	3.85	0.05
6. System of discipline by student	5.0	22.0	4.1	42.2	16.0	2.4	8.2	100.0	3.82	3.48	0.05
7. Procedures for selecting students	2.8	16.3	10.0	43.5	18.2	1.5	7.8	100.0	3.87	3.64	0.05
8. Standards for selecting students	2.6	16.6	10.6	42.9	17.6	1.6	7.9	100.0	3.86	3.62	0.05
9. Procedures for recruiting students	3.4	18.6	10.7	38.6	17.7	1.8	9.1	100.0	3.80	3.55	0.05
10. Amount of students' stipends	15.0	29.6	3.5	30.2	11.4	1.5	8.6	100.0	2.59	2.93	0.06
11. Parents' participation	11.5	24.8	4.6	33.5	12.4	2.8	9.9	100.0	3.58	3.12	0.05
12. Willingness of staff to accept student's suggestions on ways of doing things	3.8	16.2	3.2	40.3	27.7	0.8	8.0	100.0	4.06	3.79	0.05
13. Opportunity for students to plan their own activities	4.8	15.9	2.2	39.0	29.6	0.6	7.9	100.0	4.09	3.79	0.07
14. Staff members' interest in students	1.4	11.0	2.1	38.6	38.7	0.5	7.8	100.0	4.31	4.11	0.05
15. The way staff members get along with one another	1.1	9.0	3.3	39.4	38.9	0.5	7.9	100.0	4.33	4.16	0.04
16. The way students get along with one another	2.0	14.5	1.4	41.6	31.9	0.5	8.1	100.0	4.17	3.95	0.05

NOTE: Table based on response to BSQ question 59. For approximate standard errors of percents, refer to Table 6.1, Column A. The statistics reported in this table are based only on responses of those students who indicated that they had participated in the 1973 summer program.

a/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

b/ The "doesn't apply" response was intended for students who felt that an element did not exist in their 1973 summer session. However, intended use was not clear for some students, who chose this response even for some elements which, of necessity, had to exist (e.g., overall administration of program).

c/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

d/ Percentages may not total to 100 due to rounding error. The total percentage of 100.0 is based on a weighted N of 16,144, or an unweighted N of 2,313 (not including instrument nonrespondents).

e/ Means and medians are based on a scale of 1 (for "poor") to 5 (for "excellent") with a midpoint of "3" for don't know. They are computed from determinate responses only, without adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, inconsistent responses). The "doesn't apply" responses are not entered into either the medians or the means.

for "poor" to 5 for "excellent," with a middle point of 3 for a "don't know" answer. Table 6.7 presents the evaluation of the same program aspects for the 1973-74 academic year program; but unlike the previous table, it is based on the responses of all UB students (all had participated in that academic year session, by definition of the sample of BSQ respondents).

In comparing the two tables, it is seen that the rate of item nonresponse and indeterminate response is about the same in both tables (from 7.7 to 9.9 percent in Table 6.6, and from 7.7 to 11.4 in Table 6.7). But the proportion of respondents answering that an item "does not apply" is greater for the academic year program than for the summer program (from 2.8 to 7.2 in Table 6.7, and from 0.5 to 3.2 in Table 6.6).[4/] Thus, the ratings of the aspects of the summer program are based on a slightly higher proportion of the eligible respondents.

The specified aspects of program operation were rated quite good, on the average, for the 1973 summer program; however, from 10 to 44 percent of the students saw given aspects of the summer program as no better than "fair." The highest mean ratings, 4.11 and 4.16, were accorded to staff members' interest in students and the way staff members got along with one another. The lowest ratings, 2.93 and 3.12, were given to the amount of student stipend and parents' participation. The teaching, counseling, and administration by staff were given high average ratings (3.80 or above), while aspects of selecting and recruiting students were rated slightly lower (less than 3.65). Discipline by students (mean score of 3.48), interestingly enough, was rated lower than discipline maintained by the staff (mean of 3.85). Interpersonal relationships between students and staff, among students, and among staff, were all rated quite highly (3.79 or above). The students' high opinions of these relationships are consistent with those of the staff, as previously reported in Chapter 5 and with student reports during site visitation.

These same 16 aspects of the 1973-74 academic year program, presented in Table 6.7, received somewhat lower average ratings (ranging from 2.99 to 4.07). But the pattern of the average ratings of academic year elements

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[4/] This difference probably reflects the greater variability of program content in the academic year.

Table 6.7

'STUDENTS' EVALUATION OF VARIOUS ASPECTS OF THE 1973-74 ACADEMIC YEAR PROGRAM

Program Element	Percentage[a] of Students								Median Rating[e]	Mean Rating[e]	Standard Error of Mean Rating
	Poor	Fair	Don't Know	Good	Excellent	Doesn't Apply[b]	Inde-terminate[c]	Total[d]			
1. Content of curriculum	3.2	16.3	6.9	45.4	15.3	5.2	7.7	100.0	3.88	3.61	0.05
2. Quality of tutoring	2.2	15.4	5.5	39.8	22.1	7.2	7.9	100.0	4.00	3.76	0.05
3. Quality of counseling	1.6	12.9	4.7	40.0	28.2	4.4	8.3	100.0	4.11	3.92	0.06
4. Overall administration of program	1.5	12.7	6.0	40.8	27.2	3.4	8.5	100.0	4.09	3.90	0.06
5. Discipline by staff	2.4	14.1	6.1	41.0	22.6	5.4	8.5	100.0	4.00	3.78	0.05
6. System of discipline by student	3.5	18.2	7.1	40.7	15.5	6.2	8.8	100.0	3.84	3.55	0.05
7. Procedures for selecting students	2.4	15.6	11.1	41.5	16.8	4.2	8.3	100.0	3.85	3.62	0.05
8. Standards for selecting students	2.2	15.5	12.2	40.4	16.5	4.3	8.8	100.0	3.83	3.62	0.04
9. Procedures for recruiting students	3.2	16.6	11.9	38.6	16.0	4.2	9.5	100.0	3.80	3.55	0.05
10. Amount of students' stipends	13.8	25.6	5.0	31.5	10.5	4.2	9.5	100.0	3.27	2.99	0.06
11. Parents' participation	10.2	21.3	6.6	31.7	13.3	5.5	11.4	100.0	3.61	3.20	0.05
12. Willingness of staff to accept student's suggestions on ways of doing things	3.2	16.8	5.4	38.7	23.8	3.8	8.1	100.0	3.98	3.72	0.05
13. Opportunity for students to plan their own activities	4.3	16.2	4.8	37.2	26.0	3.6	8.0	100.0	4.01	3.73	0.08
14. Staff members' interest in students	1.3	11.5	3.5	39.1	33.4	2.9	8.3	100.0	4.22	4.03	0.05
15. The way staff members get along with one another	0.9	9.4	6.0	39.4	33.4	3.3	7.7	100.0	4.22	4.07	0.04
16. The way students get along with one another	2.3	13.4	3.3	41.3	29.3	2.8	7.7	100.0	4.12	3.91	0.05

NOTE: Table based on response to BSQ question 60. For approximate standard errors of percents, refer to Table 6.1, Column B.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] The "doesn't apply" response was intended for students who felt that an element did not exist in their 1973 summer session. However, intended use was not clear for some students, who chose this response even for some elements which, of necessity, had to exist (e.g., overall administration of program).

[c] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[d] Percentages may not total to 100 due to rounding error. The total percentage of 100.0 is based on a weighted N of 18,999, or an unweighted N of 2,763 (not including instrument nonrespondents).

[e] Means and medians are based on a scale of 1 (for "poor") to 5 (for "excellent") with a midpoint of "3" for don't know. They are computed from determinate responses only, without adjustment for item nonresponse or indeterminate responses (multiple, out-of-range, inconsistent responses). The "doesn't apply" responses are not entered into either the medians or the means.

was similar to the pattern discussed for the summer program (i.e., the program elements were rated similarly relative to one another). Also, the percentages of students reporting various aspects of the academic year program as "fair" or "poor" covered about the same range as that observed for the summer program (10 to 39 percent).

In summary, the responses of the students depict a program in which central functions and day-to-day operations such as teaching, counseling, and administration (including discipline) were perceived to be well conducted, and whose best qualities were rooted in certain human interactions, the staffs' interest in the students and the staffs' ability to get along with one another. Other features of program administration, such as selection and recruitment of students, were not rated quite so highly. The features perceived as being the poorest (in a relative sense) were aspects which were in whole or in part beyond the control of the staff, namely, the amount of the student stipend and the parents' participation. The operation of the summer program was seen in a slightly more favorable light than that of the academic year program.

It is quite likely that the absolute ratings assigned to aspects of the program reflect, in part, in part the "halo effect" (a tendency to rate highly all attributes of something that has high overall attractiveness or appeal), due to the students' general high enthusiasm for the program which was fairly consistently observed in the site visits. The ordering of the perceived effectiveness of aspects of program operation, however, should be less confounded by such an effect. In a very general sense, the orderings obtained were in accord with the unstructured comments of students interviewed during site visits. The summer program, typically including residence on a college campus, was seen as a "better" program, and interpersonal relationships among project staff and students were frequently mentioned as a very positive aspect of the students' participation in the UB program.

VI. STUDENT BENEFITS

The UB students were asked to specify, for each of 12 potential benefits they could gain from being in UB, how important each was to them, and the extent to which it had been received. Since the utility to the student of a received benefit is partly a function of the importance attached to that benefit, the responses regarding "importance" were cross-tabulated with those concerning "amount received." The resultant joint distribution of importance and receipt of each benefit is presented in Table 6.8. The table also provides, for each potential benefit, subtotals of the percentages of students reporting each degree of importance.

The rate of indeterminate response reported in Table 6.8 is relatively high, ranging from 17.1 to 21.2 percent. One reason for this high rate was that students who failed to answer either "how important" or "how much received" were considered as not answering the item. With these relatively high item nonresponse rates, the results presented in Table 6.8 are likely to be subject to bias and should be viewed with caution. The following discussion assumes that the results were not materially affected by any item nonresponse bias that may exist.

All of the 12 potential benefits were reported as being at least moderately important by no less than 69 percent of the students, and no more than 13 percent of the students reported any potential benefit as not important. Comparing the ratings of importance of the various benefits, it is seen that benefits more directly related to major goals of UB (continuance in high school and pursuit of postsecondary education) were generally regarded by the UB students as being the most important. Benefits more tangential to these goals were rated as being less important.

The benefits reported as "very important" by the highest proportions of students (62 percent in each case, and henceforth termed the "most important" benefits) were becoming prepared for postsecondary education and gaining a better understanding of the need for education.5/ Benefits next most frequently rated as very important (by 55 to 59 percent)6/ included benefits primarily related to personal and interpersonal growth (e.g., self-understanding, self-expression, understanding people of other cultures

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5/ Correspondingly small proportions (1 to 2 percent) rated these benefits as not very important.

6/ From 2 to 4 percent regarded these items as not very important.

Table 6.8

PERCEIVED IMPORTANCE AND RECEIPT OF POTENTIAL BENEFITS OF UPWARD BOUND PARTICIPATION

Potential Benefit	Percentage[a/] of Students													
	Not Very Important				Moderately Important				Very Important					
	Benefit Received:				Benefit Received:				Benefit Received:					
	Little or None	Moderately	A Lot	Sub-Total[b/]	Little or None	Moderately	A Lot	Sub-Total[c/]	Little or None	Moderately	A Lot	Sub-Total[d/]	Indeterminate[e/]	Total[f/]
1. Make close friends.	2.8	5.4	1.6	(9.8)	2.1	22.9	9.5	(34.5)	1.8	10.5	26.3	(38.6)	17.1	100.0
2. Learn how to study better.	1.9	1.0	0.2	(3.1)	2.8	16.5	3.0	(22.3)	5.2	24.6	26.7	(56.5)	18.1	100.0
3. Be prepared to get into and attend college or other types of schools.	2.3	0.9	0.3	(3.5)	2.4	10.9	2.5	(15.8)	5.4	20.6	36.4	(62.4)	18.3	100.0
4. Have a change from the routine of my regular school.	5.8	2.7	1.2	(9.7)	4.0	20.6	6.4	(31.0)	2.8	11.3	25.6	(39.7)	19.7	100.0
5. Gain a better understanding of myself.	1.9	0.8	0.4	(3.1)	2.2	14.3	3.3	(19.8)	3.3	17.5	35.1	(55.9)	21.2	100.0
6. Learn to express myself more effectively and self-confidently.	1.3	1.0	0.3	(2.6)	2.3	14.7	3.3	(20.3)	4.3	21.9	32.8	(59.0)	18.3	100.0
7. Gain a better understanding of people of other cultures or races.	2.2	1.3	0.4	(3.9)	3.7	15.6	4.5	(23.8)	4.1	17.6	32.9	(54.6)	17.8	100.0
8. Gain a better understanding of the need for education.	1.0	0.6	0.5	(2.1)	1.4	12.6	3.4	(17.4)	1.8	16.4	44.1	(62.3)	18.2	100.0
9. Learn to meet and get along with other people better.	1.0	0.9	0.4	(2.3)	1.7	15.2	4.2	(21.1)	2.1	17.1	38.7	(57.9)	18.6	100.0
10. Increase my participation in social and extracurricular activities at school.	6.4	1.8	0.5	(8.7)	5.3	22.3	4.3	(31.9)	3.5	13.7	23.4	(40.6)	18.9	100.0
11. Learn more about and appreciate better the heritage of my race or ethnic group.	5.0	1.8	0.4	(7.2)	5.0	17.9	2.6	(25.5)	4.8	15.7	28.6	(49.1)	18.2	100.0
12. Get financial aid for medical services and other needs beyond the stipend.	9.0	2.5	1.2	(12.7)	6.2	16.6	2.8	(25.6)	10.1	12.7	20.1	(42.9)	18.1	100.0

NOTE: Table based on responses to BSQ question 61. For approximate standard errors, refer to Table 6.1, Column B.

a/ Percentages are based on weighted responses, adjusted for instrument nonresponse.

b/ Total percent of students responding benefit was "not very important."

c/ Total percent of students responding benefit was "moderately important."

d/ Total percent of students responding benefit was "very important."

e/ This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

f/ Percentages may not total to 100 due to rounding error. The total of 100.0 percent is based on a weighted N of 18,999, or an unweighted N of 2,763 (not including instrument nonrespondents).

or races, and learning to meet and interact more harmoniously with other people). One of these relatively important benefits was learning to study better. Therefore, the benefits second in importance relate to the development of a variety of skills and of maturity, all of which would be helpful in continuing in school and acquiring higher education.

The benefits regarded as among the least important were rated by 39 to 49 percent of the students as very important and 7 to 13 percent as not very important, (thus the characterization of potential benefits as most to least important is seen to be quite relative). These benefits form a miscellaneous group, including one that had originally been intended to be rather trivial (i.e., to "have a change from the routine of my regular school"). Even though this was one of the least important benefits, some 71 percent reported it as being at least moderately important. This may indicate that some students may have participated in UB partly to escape the monotony of their schools, and subsequently rationalized their motivation by viewing the benefit as important. On the other hand, the Student Instrumentation Panel advising this study pointed out that the dullness of school for many UB students was such that this benefit genuinely represented a meaningful part of the UB experience.

Two of the other least important benefits were making close friends and learning about the students' own racial or ethnic heritage. Site visit observations and the Student Instrumentation Panel had indicated that one common outcome of the UB experience was for formation of good friends. This was not rated by the UB students, however, as one of the most important benefits; and indeed, it is only an indirect goal of the UB program. Learning about the students' own cultural heritage, also an indirect goal of UB, may not have been as important to white students as to others.

Another of the least important benefits was increasing students' participation in extracurricular activities in school. Although some may hope that UB would interest its participants in regular school to the extent of becoming more active in school life, this apparently was viewed by students as relatively unimportant compared to the other benefits. Finally, obtaining financial aid for needs not provided for by UB was also one of the least important potential benefits; the highest percentage of students across items felt it was not very important. Although this benefit is related to an indirect rather than direct UB goal, the relative unimportance of this benefit may be partly due to the necessity, reported during site visits, of the most poverty-stricken students to work and therefore not to join UB or to drop out of the program.

The extent to which potential benefits were received, given the degree of their importance, can be observed from Table 6.8. Generally, the amount received is directly related to the importance. That is, the more important a benefit the more likely it was to be reported as received at higher levels. While the general relationship can be seen in the joint distribution presented in Table 6.8, the discussion below will cite conditional percentages (i.e., the percentage of students receiving a specified amount of a benefit, given the degree of importance attached to it) that do not appear directly in the tabular presentation but that can be calculated from the statistics in the table. Such a percentage is easily computed from the entries in Table 6.8. For example, among the 3.1 percent of students who saw gaining a better understanding of themselves as not important, 61 percent of them (100 x (1.9 ÷ 3.1)) reported receiving little or none of the potential benefit.

In general, students who regarded benefits as not very important tended to report receiving little or none, or, to a lesser degree, receiving moderate amounts.[7] Similarly, the majority of students (65 to 74 percent) who viewed benefits as moderately important reported having received them moderately. Finally, for nearly all benefits, the majority of students (56 to 70 percent) who regarded a benefit to be very important also responded that they had received much of the benefit.

The relationship was not as strong in the latter case, however. Considerable proportions of the students who thought a benefit was very important also reported receiving only moderate amounts. This was especially true with respect to learning to study better, in which only 47 percent of those rating it as very important reported having received much, and 44 percent reported having received it moderately. Thus, these students viewed this skill, which is basic to the UB mission, to be among the most difficult to achieve at a level commensurate with their high desires. Another benefit with a relatively high degree of discrepancy between importance attached to it and amount received was obtaining financial help for personal needs. Of the students responding that this was very important, 47 percent reported receiving much; 30 percent received it moderately; and 24 percent received little or none. The limited financial resources of UB projects for providing such aid probably accounts for this discrepancy.

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[7] Although no more than 13 percent reported any benefit as not important, it is interesting to note the cases in which students received more than "a little or none" of these unimportant benefits. The most marked cases were making close friends and having a change from the school routine for which only 29 percent of the students rating them as not important also received little.

The type of discrepancy (between the importance of a benefit and the amount received) which would seem intuitively most disappointing to the students would be the case of receiving little or none of something very important. This situation was not infrequent, since 10 to 30 percent of those students rating a benefit as very important also reported having received little or none. The percentages were greatest for learning how to study better and being prepared for postsecondary schooling, for which 29 and 30 percent, respectively, of the students who reported high importance received little. These discrepancies are noteworthy because these benefits are basic to UB's purpose. Other potential benefits for which a considerable proportion (19 to 26 percent) of the students who regarded them as very important received very little include: learning more effective self-expression, understanding better other cultural or racial groups, participating in extracurricular activities in school, learning and appreciating the students' heritage, and obtaining personal financial help. The last benefit is generally beyond UB projects' capability; but the other three benefits, though not direct UB goals, were nevertheless important aspects of the UB experience for these students.

Because the relationship between importance of a potential benefit and the amount received was direct, the benefits most students perceived as very important were also generally received in high amounts, though not necessarily the highest amounts.[8/] With the exception of obtaining

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[8/] The percentage of students reporting having received any potential benefit to any specified degree may be obtained by summing the appropriate columns of Table 6.8.

personal financial help, no more than 15 percent of the students reported having received only little or none of any potential benefit.[9] Excluding this benefit, 66 to 78 percent of the students reported having received the other benefits in at least moderate amounts. The percentages of students reporting at least moderate receipt of the benefits most directly related to UB's goals were 72 percent for becoming prepared for postsecondary education and 78 percent for gaining a better understanding of the need for education. Learning to study better, a skill related to the other two benefits, was also reportedly received in at least a moderate level by a high percentage of students (72 percent). It appears that the majority of the UB students felt that they were developing skills and attitudes necessary for continuing their education and pursuing higher education.

In summary, UB students felt that benefits most central to the purpose of UB--the pursuit of postsecondary education--were the most important; next in importance were benefits that facilitate the pursuit of education, such as personal and interpersonal growth. The majority of students reported having received all listed benefits, in at least moderate amounts. The amount of a benefit students reported receiving was generally commensurate with the degree of importance they attached to it. The relationship between rated importance and rated receipt of a benefit may be due to a tendency of people to consider that which they have obtained as more important than that which they have not.

An even more indirect benefit that students could derive from participating in UB is explored in Table 6.9. This table presents the judgment of UB students about whether persons at their schools, their relatives, and people in their community had changed their opinions of the students as a result of their participation in UB. These data should be treated with more than ordinary caution because the UB students were required not only to make subjective judgments, but to make them regarding other person's opinions of them (the students). The results are of some interest, however, because it has been suggested that a side effect of UB could be to enhance or worsen the image of its participants in the eyes of those around them. As seen in Table 6.9, for any of the persons considered, substantial

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[9] Recall, however, that the item nonresponse rate was about 18 percent for all benefits.

Table 6.9

PERCEIVED CHANGES IN OPINION ABOUT THE STUDENTS AFTER UPWARD BOUND PARTICIPATION

	Percentage[a] of Students					
Type of Group	They Think Less Highly of Me	No Change	They Think More Highly of Me	Doesn't Apply or Don't Know	Indeterminate[b]	Total[c]
Teachers at school	2.6	46.6	27.2	18.3	5.3	100.0
Counselors at School	2.5	39.0	37.8	15.3	5.4	100.0
Students at school	2.8	50.5	27.8	12.9	6.0	100.0
My parents	2.1	30.4	55.8	6.0	5.7	100.0
My sisters and brothers	2.1	42.3	39.4	10.5	5.8	100.0
People in my community	1.9	43.0	28.1	21.5	5.5	100.0

NOTE: Table based on responses to BSQ question 56. For appropriate standard errors, refer to Table 6.1, Column A.

[a] Percentages are based on weighted responses, adjusted for instrument nonresponse.

[b] This represents primarily item nonresponse (i.e., failure to answer an item), but also includes multiple responses, out-of-range responses, and inconsistent responses.

[c] Percentages may not total to 100 due to rounding error. The total of 100.0 percent is based on a weighted N of 18,999, or an unweighted N of 2,763 (not including instrument nonrespondents).

proportions (30 to 50 percent) of the UB students reported no change in opinions, and generally more students reported no change than reported either a positive or a negative change in the opinions of others. The one exception was parents in which case 56 percent of the UB students reported their parents as having an improved opinion of them. Excepting parents, only 27 to 39 percent of the UB students felt that their participation in UB had a favorable effect on changing the opinion of various people about them. Only a small proportion (less than 3 percent) of the UB students reported that others thought less of them as a result of their participation in the program. Thus it appears, that at least as reported by the UB students, their participation in UB had exerted no major effect in improving their image in the eyes of most others around them.

VII. SUMMARY

This chapter has described the perceptions of the UB program as reported by a subgroup of participants (i.e., BSQ respondents). These students had participated in varying numbers of UB sessions, from only one academic year session to more than three summer and academic year sessions--with a median length of program participation of less than one year. Most frequently, these students reported having first heard of the UB program from other UB students or from school guidance counselors.

According to the students' reports, the activities (of those 32 specified) that had been most commonly available to them were also the ones characterized by the highest participation rates among students to whom the activities had been available. These include such basic courses as reading, English, and mathematics courses, as well as tutoring, counseling, and athletic, social, and cultural activities. These were also the activities that the participating students rated as most helpful to them. The common availability, participation, and reported helpfulness of these activities are in accord with the staff's report that tutoring or remedial instruction, counseling, and cultural enrichment were three of the most emphasized functions in UB projects.

From a list of 12 benefits potentially obtainable from the UB experience, the benefits most directly related to two of the major goals of UB (continuance in high school and pursuit of postsecondary education) were reported by the students as being the most important to them. These included the benefits of gaining a better understanding of the need for education and of being prepared to attend college or other types of schools. Benefits more indirectly related to major goals were next in importance, such as personal development and interpersonal growth. The majority of the students also reported having received these benefits, as well as others, in at least moderate amounts. Generally, the more important a benefit was to the students, the more likely he was to report having received it in higher amounts. Among the most important deviations from this trend were the considerable proportions of students who, although they viewed the benefits of learning better study skills and becoming prepared for postsecondary education to be very important, reported that they had received these benefits in moderate rather than in great amounts.

The students' evaluation of 16 aspects of program operations in the 1973 summer and 1973-74 academic year programs was also presented. The UB students' perceived the relative strengths and weaknesses of their projects in the two sessions similarly, although summer session operation was seen as slightly superior. Generally the central functions of UB and day-to-day operations (such as teaching, counseling, administration, and discipline) were well conducted in the opinion of the students. The UB students rated the staffs' interest in the students and the harmonious relationships among the staff as the best qualities of the program.

As seen in this chapter, the overall tone of the students' perception of the UB program is quite positive. This is in agreement with the perception of the staff as reported in previous chapters and with the observations made during site visitation. There are, however, some students (and in some cases rather sizable proportions of them) who see certain aspects of the program in a less than favorable light. As many as 30 percent of those who had participated in certain program activities found such participation to have been of little or no help; certain aspects of the UB summer and academic year programs were seen as no better than fair by upwards of 45 percent of the UB participants; and some potential benefits of the UB program were seen as being received in small amounts or not at all by 10 percent or more of the program participants. While such negative results detract somewhat from the basically positive view of UB reported by most students, they should not be taken as an indictment of the program. It would be unrealistic to imagine that any program such as UB could be all things for all participants. It would be equally naive to suppose that all projects (particularly relatively new ones) perform all functions at peak efficiency and maximum effectiveness.

What does emerge from the student perception data is a picture of a program that is seen by the participants as doing many things quite well and some things not as well. More importantly, in the eyes of the students, the program seems to be most successful in those areas more directly related to its stated goals, those areas which are reported by the staff as most emphasized, and those areas over which the staff have greatest control.

Chapter 7

Student Outcomes as a Function of UB Participation

I. GENERAL

Previous analyses, presented in Chapters 4, 5, and 6, have focused on a description of the structure and function of the UB process. The major purpose of the study reported in this volume, however, is an examination of possible relationships between UB participation and student outcomes. Of specific concern are student outcomes related to the three major objectives of the UB program: (a) to increase the high school retention rates of participants, (b) to increase, among participants, the rate of entry into postsecondary education (PSE), and (c) to generate the skills and motivation necessary for success in education beyond high school.

Difficulties in operationalizing the third major objective notwithstanding,[1] this chapter addresses the differences between the UB and CS group on variables related to the three major objectives. Prior to presenting results of these comparisons, however, it is considered very important to clarify, and in some cases to reiterate, certain matters which are basic to the analyses. The two topics to which reader attention will be directed in this introductory section are: (a) a specification of the major variables used in the analyses, and (b) the approach to, and limitations of, the analyses.

A. Variable Specification

As previously discussed in Chapter 2, Section VII, the data available for the entire set of students were restricted to a small number of measures abstracted and distilled from the various student instruments. In addition to the measures obtained from the STF, the variables of major concern in this chapter are those contained in the student Master File (see Chapter 3, subsection IV.A). A detailed definition of these variables is available in Appendix E; however, to insure that the reader is completely aware of the nature and limitations of the primary measures referenced in this chapter,[2] brief descriptions are presented in this subsection.

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[1] A discussion of difficulties involved in defining and measuring variables related to the third mandated objective appears in Chapter 1, subsection III.C.3.

Poverty Level Index. Only a very gross index of family economic status is available from the data common to all students. The index used is closely related to, but not identical to, the federal poverty level guidelines.[3] While the federal guidelines define poverty status as a joint function of family income, family size, and family location (farm or nonfarm), the index used in this study is based on family income and size only (since farm or nonfarm status is not available for all students). Further, information concerning family income as collected by the instruments used in this study gave gradations of income which are considerably less refined than those specified in the federal guidelines. It should also be noted that the index used for this study was based on student reports of family size and income, the latter, in particular, being subject to considerable error.

Academic Risk Index. The academic risk status of a student was determined on the basis of ninth grade academic information. The use of ninth grade information provides a time point which is "prior" to UB entry for nearly all of the UB participants considered.[4] A student was considered to be an academic risk if his academic grade point average (GPA)[5] was such that he would fall in the bottom half (50th percentile or less) of his class.[6] If academic GPA could not be computed (or converted to a percentile rank), then a student was classified as an academic risk only in the event that he failed 20 percent or more of the academic courses which he attempted.

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[2] Some of the variables analyzed in this chapter come directly from responses to specific items of specific student instruments. Such variables are defined by the questionnaire item itself (Appendix D) and warrant no further definition. Other variables are simple transformations of responses to specific questionnaire items and will be defined when presented.

[3] Application Information and Program Manual (1972-73): Talent Search, Upward Bound, and Special Services. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Education Division, Office of Education/ Bureau of Higher Education, December 1972, Appendix A.

[4] The possibility of using a time point corresponding to "year before UB entry" was considered, but such a definition lacks meaning for the CS group and was thus abandoned.

[5] Academic GPA was computed from STF entries using "academic" courses only (see subsection I.A.7 below and Appendix E).

High School Continuance/Completion Index Within School Year. An outcome central to this study is high school (HS) continuance or completion for the twelfth grade. One index of continuance/completion may be obtained within the 1973-74 school year by noting the HS enrollment status in fall 1973 and spring 1974. Since all legitimate sample members were in HS during fall 1973 (see Chapter 3, subsection IV.B), a student reporting that he was either in HS or graduated from HS in spring 1974 was considered to have continued/completed during that school year. An assumption is made, of course, that a student still in HS in April (the time of data collection) would continue throughout the remainder of the school year. This index is based on student self-report, but was verified by reports of project or high school staff members.

High School Continuance/Completion Index Between School Years. Another index was computed relating to HS continuance/completion from one school year to the next. This index is, in general, calculable only for the students providing fall 1974 data.[7] Although appropriate weight adjustments were made to account for the fall 1974 subsampling, the possibility of respondent bias remains (see Chapter 3, section VI). It should also be pointed out that the between school year HS continuance/completion index is based exclusively on unverified student self-reports.

Postsecondary Entry Index. Indication of entry into PSE is obtained from all data available on the student through fall 1974, although it is primarily available from FSQ responses. If a student indicated entrance to any institution of PSE at any time subsequent to fall 1973, he is considered to have entered PSE, regardless of whether he remained in that institution. Thus, the measure obtained does not reflect PSE persistence. With few exceptions, this index is based exclusively on unverified student self-reports.[8]

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[6] Transformation of grade averages from various grading systems to percentile ranks was accomplished by use of a conversion table given in Appendix E.

[7] In some cases, completion could be imputed from spring 1974 data. Specifically, a student who reported high school graduation in spring 1974 would maintain his completion status in fall 1974.

High School Equivalency Education Program Indices. The extent to which high school dropouts avail themselves of other alternatives for high school completion is of interest as a student outcome. One available alternative was measured by the student instruments, specifically High School Equivalency Education Programs (HSEEP). Two HSEEP indices were constructed; the first indicates entry into HSEEP, while the second indicates successful completion of HSEEP (i.e., receipt of high school diploma or equivalent). These indices are based exclusively on unverified student self-reports.

High School Academic Measures. Information concerning HS academic performance is available from the completed STF. Five measures of this academic performance were computed for each grade level from ninth grade to "current" grade (i.e., grade level in fall 1973). The five measures (based on eight reduced HS course information variables--see Appendix E) are: (a) normalized academic GPA; (b) proportion of attempted academic credits passed; (c) proportion of credits attempted that were academic; (d) proportion of academic credits attempted that were advanced; and (e) proportion of academic credits attempted that were remedial.

With one exception, the measures are straightforward. The normalized academic grade point average is, however, a relatively complex measure. With the aid of conversion tables (see Appendix E), average grades within a grade level were transformed into a common scale of percentile ranks. The resultant percentile ranks were then converted to a unit normal distribution with expected value of 5.[9] This double transformation provides a common scale for different HS grading systems as well as a measure with excellent scale qualities.

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[8] Some instances in which PSE entry had been accomplished at the time of the spring 1974 data collection period (primarily in the case of early high school graduation) were verified by project or high school staff.

[9] Thus, a percentile rank of 50 mapped into a score of 5.00 and a percentile rank of 95 mapped into a score of 6.96.

For analysis purposes, only the measures computed for grade 9 and for current grade are used (the full set of five ninth grade measures and change scores for all five variables from ninth to current grade). These measures are based on official reports of academic performance.

B. Approach to Analysis

The approach to analysis used in this chapter is, in general, straightforward; however, some of the analytic techniques used may be less familiar to the reader than others. This subsection provides a brief overview of the mechanics of analysis and conventions of data presentations that are common to this chapter.

Use of Sampling Weights. To provide unbiased estimates of population parameters, sampling weights were used in computing the various statistics reported in this chapter. The raw sampling weight associated with a student is simply the inverse of the probability of selecting that student. The use of sampling weights overcomes possible bias in the resulting statistical estimates which may be introduced because students were selected with unequal probability (due to oversampling of specific groups).

Balancing. In order to provide more meaningful analyses of student outcomes, a balancing procedure was used to statistically equalize the UB and CS groups with respect to certain preprocess and extraprocess variables. An example of the procedure is presented in subsection II.B below, and the technique is fully described in Appendix F. In essence, the balancing procedure forces an equivalence of the UB and CS groups in terms of characteristics which are related to outcomes but which have not been completely controlled by the study design (i.e., sex, race, academic risk status, poverty level status, etc.), thus bringing about greater comparability of the two groups.

Adjustment for Missing Data. In previous chapters, some discussion of weight adjustment for instrument nonresponse has been presented. Where instrument specific responses are used in this chapter (e.g., BSQ item responses), similar adjustments have been made. Such adjustments involve an apportioning of the sampling weights of nonrespondents (those who were eligible for administration of an instrument but who did not complete it) among the respondents who are most like them (i.e., from the same project or school, and of the same sex, race, academic risk status, poverty status, and grade level). The Master File variables were obtained from many different instruments, however, and adjustments for missing data were made for each variable considered. The technique used to adjust for item nonresponse is identical to that used to adjust for instrument nonresponse.

Conventions of Data Presentation. Due to the central importance to the study of the analyses reported in this chapter, a generalized table of standard errors is not used. Rather, the standard error for each comparison is reported separately, either in tabular form or in the text. Exceptions to this general policy are cases in which differences in two proportions are less than 1 percent; for such cases, standard errors were typically not computed. Most comparisons between the CS and UB groups, in terms of major outcome variables, are made within grade level (i.e., tenth grade UB participants compared to tenth grade comparison students). Moreover, within grades 11 and 12, UB students are frequently partitioned into separate subgroups depending on the extent of their participation in the program. While this approach suffers somewhat from a loss of cases for analyses (data shrinkage due to lack of, or inconsistent, information regarding the classifier variables), it is considered to provide much more meaningful comparisons within the model of educational continuance that has been adopted for this study.

C. Limitations of Analysis

Care was taken throughout the analysis to avoid comparisons which would introduce favorable or unfavorable bias toward the UB program. Considerable effort was made to insure that the data entering analysis were consistent (see Chapter 2, section VIII; Chapter 3, sections III through V). The sample was designed to reduce many of the possible differences which could exist between the UB and CS groups (and which could, therefore, lead to spurious group differences). Statistical equalization of the two groups was undertaken in an attempt to reduce contamination of results by possible preprocess and extraprocess differences. Weight adjustments for indeterminate response at the instrument and item level were employed in critical analyses in an effort to avoid distortion of the findings due to incomplete data collection. Standard errors were computed for all major differences so that probability statements concerning the populations of interest could be made and "true" differences could be uncovered.

Although it is quite likely that these efforts were rewarded, they do not insure removal of all possible confounding factors. Further, two problems that are inherent in questionnaire surveys remain: (1) the validity of the reported information, and (2) the inability to definitively establish causation. These problems are discussed briefly below.

1. Validity of Data

The preponderance of data is based on unverified student self-reports. In addition to known biases in student reports (of such matters as high school grades, parent income, parent education level), invalid responses may be traced to a diversity of possible sources (e.g., deliberate attempts to mislead, lack of understanding or misinterpretation of questions, and simple errors in marking responses). Previous examinations of data reliability (see Chapter 3, Section V) have indicated only a moderate degree of agreement between student self-reports and project (or school) reports within the small subset of data elements for which verification could be attempted. However, there is no reason to believe that other student-reported data would show any better agreement with reports from other sources.

The problem of data validity may be compounded through the weight adjustment procedures, particularly when invalid data are collected from a student who is similar to a large group of nonrespondents. The real danger of the validity problem, however, is that of differential validity of responses within the two groups. While a lack of reliability and validity serve to introduce error into the data, if this error is the same (regardless of direction or magnitude) within the UB and the CS group, then group differences will show no directional bias. If, on the other hand, the data from one group are biased in a particular direction and those from the other group are unbiased (or biased in the opposite direction), then the bias will remain (or be magnified) in the group differences. While there is no defensible reason to suspect that differential response biases exist between the two groups, the possibility of this source of error in group differences does exist.

2. Establishing Causation

A logical error which is made with sufficient frequency to warrant discussion is that of inferring causality from an established relationship. While the existence of a relationship between two variables is a necessary condition for the existence of causation, it is not a sufficient one.[10/] In addition to a relationship between two variables (conditions), establishment of causation requires that: (a) the causal variable (antecedent condition) logically precedes the effect (consequent condition); and (b) no other antecedent variable exists which may explain both the antecedent and consequent variables under consideration. While the first of these requirements is often fairly easy to establish, the second is extremely difficult to establish outside the true experimental paradigm. Large advances have been made recently in the area of causal modeling in nonexperimental or quasiexperimental research paradigms; however, the assumption of inclusion of all relevant variables in the model is a basic tenet in these approaches.

In the area of educational intervention programs, it would be extremely difficult, if at all possible, to identify (much less to measure) all the relevant student, process, and external factor

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[10/] A well known example is the strong negative relationship that exists between the number of mules and the number of individuals with doctorates in a state. It is a statistical fact that states with the greatest number of mules have the smallest number of people with a Ph.D. degree, and conversely. A policymaker concerned with increasing the number of Ph.D.'s in a state would be ill advised, however, were he to attempt to accomplish this by organizing a wholesale reduction in the mule population.

variables which may influence one another and/or student outcomes. Thus, even though strong associations are shown in this chapter between UB participation and certain student outcomes, the possibility still remains that these associations are largely a function of other unconsidered (or unmeasured) antecedent variables which are related to both student outcomes and selection of UB participants.

II. PREPROCESS AND EXTRAPROCESS DIFFERENCES BETWEEN THE UB AND CS GROUPS AND RELATED ADJUSTMENT TECHNIQUES

Throughout this volume, discussions of issues surrounding the comparison of output measures for UB participants and a comparison group have stressed the importance of the equivalence of those two groups on relevant characteristics other than UB participation. The importance of this equivalence is perhaps best pointed out by reference to the comparison process model introduced in Chapter 2 (Figure 2.2, p. 2.6). Output from the system (in this case student outcomes) is seen as a joint function of: (a) the process under consideration, (b) the input to the process, and (c) other processes in operation. Differences in student outcomes between the CS and UB groups could be attributable to any combination of these three factors, either additively or in interaction. To attribute differential output exclusively to the process under consideration, it is necessary to have equivalence or control of the UB and CS groups in terms of background variables and exposure to other processes (programs) that relate to the output measures under consideration.

Clearly, it would be impossible to equate the two groups on all dimensions of input and other external process operations; however, attempts to equalize the two groups as much as possible on relevant variables is a sound analytic technique that should be undertaken. Elimination of some relevant dimensions on which the two groups could differ was, in fact, accomplished by the design. CS group students were selected from the same schools and within the same grade levels as the UB participants (see Chapter 2, section IV). This selection procedure built into the study an equivalence of the two groups in terms of some major external processes, i.e., regional, state, district, and school-specific general educational environment.

Further, such a design produced two groups which were of the same general age and educational attainment.

Still, the two populations defined by the UB and CS samples should differ on other relevant variables due to constraints on UB membership. Within a given HS, those students selected for UB should differ from nonparticipants since the UB participants are academic risks and come from families with limited economic means (and thus were selected from a defined subpopulation of the total HS student body). It should be recalled that sampling of the CS group was carried out in a manner designed to reduce differences between the UB and CS samples on the factors of academic risk and poverty status.[11/]

Design, however, cannot always assure group equivalence (in fact, for the current study it was not anticipated that such would be the case) and equalization after the fact is often required. Such was the case in the current study. The technique of statistical adjustment used in this study to achieve a posteriori group equalization was a form of balancing (see subsection II.B and Appendix F).

The subject of this section is an examination of the characteristics of the UB and CS groups in order to uncover possible preprocess or extraprocess differences. Statistical adjustment techniques which were used to correct for observed differences will also be discussed.

A. Differences in Major Background Variables for the Total UB and CS Groups

Recalling that data available for the entire group were limited to a subset of variables, it should be clear that analysis of preprocess group differences for the total UB and CS groups is restricted to those variables of the Master File and STF. Table 7.1 shows both the weighted[12/] and unweighted distributions of the UB and CS groups on sex, race, age, poverty level status, academic risk status, and grade level in the fall of 1973.

[11/] Based on the best information available at the time, sampling of the CS group included oversampling of students who were both poor and academic risks (see Chapter 2, subsection IV.A).

[12/] Weighted percentages were computed using raw sampling weights (inversely proportional to probability of selection).

Table 7.1

DEMOGRAPHIC CHARACTERISTICS OF THE STUDENT GROUPS

Variable	Response Category	Unweighted Percentages		Weighted[a] Percentages		Standard Error of Difference[b]
		UB Group	CS Group	UB Group	CS Group	
Sex	Male	44.7%	51.7%	44.2%*	53.5%	2.7 %
	Female	55.3	47.2	55.8 *	45.7	2.7
	Indeterminate[c]	0.0	1.1	0.0 *	0.8	0.3
Race	Black	63.3	36.7	60.9 *	27.9	4.2
	White	16.6	43.8	17.9 *	55.2	4.6
	Other	18.7	14.4	19.9 *	12.2	3.2
	Indeterminate[c]	1.4	5.1	1.3 *	4.7	0.8
Age	14 or less	1.0	1.0	1.0	0.8	
	15	6.9	12.4	6.8	14.6	
	16	23.0	25.6	22.3	31.0	
	17	35.8	30.6	35.6	28.7	
	18	25.5	20.2	26.1	17.7	
	19	5.6	4.0	6.0	2.5	
	20	1.0	1.0	1.1	0.4	
	21 or more	0.2	0.3	0.2	0.3	
	Mean[d]	—	—	17.0 *	16.6	0.057
	Indeterminate[c]	1.0	4.8	1.0 *	4.1	1.0
Poverty Level	Poverty Level	64.4	49.4	64.5 *	34.6	2.6
	Not Poverty Level	22.6	47.0	22.5 *	61.3	3.1
	Indeterminate[c]	13.0	3.6	13.0 *	4.1	1.7
Academic Risk	Risk	44.3	52.7	45.3	46.4	2.4
	Not Risk	54.9	46.3	54.0	52.7	2.3
	Indeterminate[c]	0.8	0.9	0.7	0.8	0.5
Grade Level (Fall 1973)	10	14.6	32.2	14.3 *	37.3	2.4
	11	37.9	32.7	37.8 *	32.2	1.3
	12	44.9	33.7	45.3 *	29.1	2.0
	Indeterminate[c]	2.6	1.4	2.6	1.4	0.6
Number of Cases		3,442	2,145	20,906	1,326,036	

NOTE: Percentages are computed within student groups within the particular variable considered and may not total 100 percent due to rounding error. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a] Weighted percentages are computed using raw sampling weights, and as such are population estimates.

[b] Computed for weighted data.

[c] Indeterminate response represents either no data or inconsistent data.

[d] Reported value is mean of determinate responses.

The weighted distributions provide unbiased estimates of the UB and CS populations. A comparison of weighted percentages indicates the extent to which the national population of UB participants differs from the population of HS students with whom they go to school.[13] Since UB participants are not selected randomly from the population of students in the feeder schools, it is not to be expected that the two groups would have similar profiles in terms of the variables presented in Table 7.1. As such, the group differences reflect the selection procedure used by UB staff in choosing participants from the "feeder" high schools. The unweighted percentages are not estimates of populations, but rather they show the distributions of the selected variables for the actual samples of UB participants and comparison students. In general, the CS sample is more similar to the UB sample than the CS population is to the UB population. This, of course, was one of the purposes of the sampling plan which selected comparison students "like UB participants" with greater likelihood. The 3,442 UB participants selected in the sample represent an estimated 20,906 UB participants nationally, and the 2,145 members of the CS sample represent a national CS population of 1,326,036 students.

Also shown in Table 7.1 are standard errors of differences[14] for the reported weighted proportions and means. If, in fact, no difference exists between the two groups, then a difference which is as large or larger than two standard errors would be expected to occur, by chance sampling variation, less than 5 percent of the time. Such a difference will be considered statistically significant. It can be seen that the two samples clearly represent two different populations. The UB population contains more females and fewer white students than the CS population. The UB group is also seen to have a much higher concentration of students within the poverty level classification and to be more concentrated in grades 11 and 12. This latter fact probably explains why the UB group tends to be older than the other students attending the high schools from which they are selected. The UB and CS populations appear to be quite similar in terms of academic risk classification, so that the oversampling of CS students considered as academic risks tended to inflate the proportion of CS academic risks in the sample which was drawn.

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[13] It is important to realize that the population considered here is not all other HS students in coterminous USA. Rather, it is those HS students who are not in UB but who are attending the UB "feeder" schools. Due to geographic location of projects and discretion on the part of the project as to the schools from which it will recruit, it is not reasonable to assume that feeder schools are representative of all high schools nationally. Therefore, it is not warranted to assume that the CS population is representative of all HS students nationally.

[14] The standard error of the differences of two statistics is an index of the extent of variability of the difference in those statistics which would be expected under the same design over different possible samples.

To further study possible preprocess differences between the UB and CS groups, examination of ninth grade academic information available from the STF was undertaken. The results of the analysis are presented in Table 7.2. Again, both weighted and unweighted statistics are presented, but differences between the two types of computations are quite minor. The variables considered in Table 7.2 are those defined in subsection I.A. Even in light of the slightly higher (but not statistically significant) proportion of indeterminate data in the UB group, the similarity of the two groups for these academic measures is quite marked. This strong similarity suggests that the two groups do not differ on these preprocess variables and that no adjustment involving these variables need be undertaken.

In summary, it is clear that preprocess differences exist between the UB and CS groups and that some form of equalization is necessary prior to examination of differences in outcome measures between these groups. The procedure used to accomplish this balancing is discussed briefly in the following subsection and more fully in Appendix F.

B. Balancing Procedure

In cases such as the current one, where moderator variables (preprocess variables) are related to dependent variables (student outcomes) and where the distributions of these moderator variables are different for the groups under consideration (UB and CS), it is usually sound analytic practice to adjust or correct the dependent variables for the influence of the moderator variables. There are many techniques available to accomplish this adjustment process. Perhaps the most widely used is linear regression, in which the linear relation of moderator to dependent variable is removed

Table 7.2

ACADEMIC BACKGROUND OF THE STUDENT GROUPS

Variable[a]		Unweighted Statistics		Weighted[b] Statistics		Standard Error of Difference[c]
		UB Group	CS Group	UB Group	CS Group	
Ninth Grade Normalized Academic GPA	Indeterminate[d]	17.2%	10.1%	16.0%	10.4%	3.3%
	Mean[e]	5.052	4.949	5.048	5.094	0.049
Ninth Grade Proportion of Courses That Were Academic	Indeterminate[d]	14.1%	8.2%	13.1%	9.2%	2.6%
	Mean[e]	0.663	0.646	0.666	0.653	0.008
Ninth Grade Proportion of Academic Courses Passed	Indeterminate[d]	14.7%	8.3%	13.7%	9.2%	2.7%
	Mean[e]	0.914	0.888	0.912	0.913	0.009
Ninth Grade Proportion of Academic Courses That Were Advanced	Indeterminate[d]	14.1%	8.2%	13.2%	9.2%	2.6%
	Mean[e]	0.244	0.228	0.240	0.256	0.016
Ninth Grade Proportion of Academic Courses That Were Remedial	Indeterminate[d]	14.1%	8.2%	13.2%	9.2%	2.6%
	Mean[e]	0.002	0.002	0.002	0.001	0.001
Number of Cases		3,442	2,145	20,906	1,326,036	

NOTE: Statistics are computed within student group (CS or UB) for the particular variable considered. None of the differences reported in this table are statistically significant (P < .05).

[a] See Appendix E for definitions of academic, normalized GPA, advanced, and remedial.

[b] Weighted statistics are computed using raw sampling weights.

[c] Computed for weighted data.

[d] Statistic given is percent of indeterminate responses, consisting of either no data or inconsistent data.

[e] Mean is computed only for respondents with determinate data.

(e.g., analysis of covariance, partial correlation techniques). A very simple form of this technique is well adapted to quantitative data when one is willing to assume that the majority of the moderator's influence is linear and equivalent for different subgroups. It is felt, however, that the majority of the data for this study will not support any of the necessary assumptions required for linear regression adjustment procedures.

Another approach to data adjustment is the analysis of variance model. This technique, considered within the frame of general linear models, may be used to examine the "effects" (both main effects and interaction effects) of specific categorical factors having removed any effect attributed to other categorical factors. Like the linear regression model, relatively strong assumptions about the data must be made (e.g., equality of variances over subgroups), and this technique is best applied to quantitative dependent variable data. It would be difficult to employ an analysis of variance model, since the number of cases in some cells of the model would be extremely small. Further, since much of the UB dependent variable data will be proportions, considerable data transformation (i.e., log or arc sine transformations) would be required, and reporting such transformed data often clouds the data picture. It is felt that the data are typically not appropriate for this adjustment procedure either.

Instead, a balancing procedure which adjusts the observed data with respect to distributional properties of the moderator variables was used. The adjustment procedure is specified in detail in Appendix F, but will be illustrated here by a completely hypothetical example for the interested reader. Suppose that a situation existed as shown in Table 7.3.[15/] From the table it can be seen that there are two groups (A and B) that differ in terms of the proportion of students falling into the levels of poverty status (80 percent of those in group A are classified as within the poverty level, while only 20 percent of those in the unbalanced group B are so classified). Moreover, it is seen that within both groups, poverty status classification is related to average GPA (lower grade point averages are associated with poverty level classification). More importantly, it can be

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[15/] The problem posed in the example given may be recognized by some readers as equivalent to the nonorthoganality problem in analysis of variance.

Table 7.3

EXAMPLE OF BALANCING TECHNIQUE USING HYPOTHETICAL DATA RELATING TO GRADE POINT AVERAGE AND POVERTY STATUS

	Group Classification					
	Group A		Group B Unbalanced		Group B Balanced	
Poverty Status Classification	Proportion of Students	Average GPA	Proportion of Students	Average GPA	Proportion of Students	Average GPA
Poverty Level	.80	2.0	.20	1.5	.80	1.5
Not Poverty Level	.20	3.0	.80	2.5	.20	2.5
Total Group[a/]	1.00	2.2	1.00	2.3	1.00	1.7

NOTE: These data are purely hypothetical and do not reflect the true distributions for any group on poverty status or on any measure of GPA used in this study.

[a/] The average GPA for the total group is obtained as a weighted sum of the subgroup means within that group. For example, the total group A average GPA is determined as (.80)(2.0) + (.20)(3.0) = 2.2.

seen that within either level of poverty status classification, group A has a higher (by .5) average GPA than group B.

To this point, all indications from the hypothetical data in Table 7.3 would indicate that those in group A were obtaining better grades than those in group B, regardless of poverty status. Some confusion arises, however, when comparing the total group means for group A and the unbalanced group B. The total group mean is obtained as a weighted average of the subgroup (poverty level classification) means within that group. The group A average GPA is given by (.80)(2.0) + (.20)(3.0) = 2.2; while for the unbalanced group B it is (.20)(1.5) + (.80)(2.5) = 2.3. The results of this averaging may be distressing to some readers since it indicates that group B has, on the average, a higher grade point average than group A; however, this is a statistical fact. Even though the subgroup means stand in an order clearly favoring group A, the total group means are juxtaposed. The apparent anomaly has been brought about due to the differential distribution of the two groups in respect to poverty status coupled with the fact that poverty status itself is related to GPA.

If the analytic question to be answered is concerned only with group means, irrespective of any difference which may exist between groups on the distribution of the moderating variable, then the answer is clearly that group B has a higher grade point average than group A. If, on the other hand, the analytic question is concerned with differences between the two groups free of the effect of differential poverty status, then it is equally clear that a comparison of the uncorrected group means obscures the true situation. The balancing technique used in the analyses reported in this chapter would resolve the incongruity by creating an artificial group B population which is comparable to group A in terms of the poverty status distribution (i.e., a group B in which 80 percent of the members were classified as poverty level). This is the situation shown for the balanced group B in Table 7.3. Comparing the total group A mean for GPA (2.2) to the balanced group B mean (1.7) reflects the fact that group B members within any poverty classification have an average GPA which is greater by .5 than that for nonparticipants. In other words, when adjustment is made for differential distribution of the moderator variable within the two groups, the effect of that moderator variable is balanced across the two groups.

The actual balancing technique used in analysis involved more than two balancing categories, but the example given shows the general manner in which the balancing was performed. The technique statistically equates the joint distribution of possible moderator variables within the two groups (i.e., it forces the proportion of poor, academic risk, black, female, twelfth grade students in the CS group to be identical to the analogous proportion in the UB group, etc.). This technique makes fewer assumptions about data quality than either the analysis of variance or regression techniques and allows somewhat greater flexibility in the choice of data elements to be adjusted. Obviously, this method can be applied for one, two, or more moderator variables, either jointly or singly, provided cell frequencies are of sufficient size to provide stable estimates of all proportions and means.

As a result of previous examinations of group differences, the following moderator variables were used in balancing (adjustment): sex, race, grade level, poverty status, and academic risk status. Since many of the critical analyses were conducted within grade level, the first set of adjustments was done within the three grade levels considered. Within each grade level, 16 balancing categories were formed.[16/] A description of the balancing categories and the distribution by grade of the UB and CS groups over these categories is given in Table 7.4. After adjustments had been made within grade, further adjustments over grade level were carried out for aggregate comparisons.

C. Other Uncontrolled Sources of Group Differences

Although the balancing procedures described above introduced the desired statistical control for those variables used in the balancing, it was not expected that this would eliminate all group differences related to other relevant variables (differences in input and/or exposure to other relevant processes). Some insight into the extent to which the two groups

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[16/] The balancing categories were formed by a complete or partial crossing of the variables sex, race, poverty status, and academic risk status.

Table 7.4

PERCENTAGE OF STUDENT GROUPS IN BALANCING CATEGORIES BY HIGH SCHOOL GRADE LEVEL IN FALL 73

	Fall 73 Grade Level[a]											
	10				11				12			
	Unweighted		Weighted[b]		Unweighted		Weighted[b]		Unweighted		Weighted[b]	
Balancing Category[c]	UB	CS	UB	CS	UB	CS	UB	CS	UB	CS	UB	CS
1. Poverty Level, Academic Risk, Black Male	8.8%	7.2%	8.4%	5.1%	9.1%	8.9%	8.6%	5.7%	10.0%	7.3%	9.5%	4.3%
2. Poverty Level, Nonrisk, Black Male	7.9	3.1	7.6	1.7	7.9	4.7	7.1	2.9	8.5	2.5	7.7	1.4
3. Nonpoverty, Academic Risk, Black Male	5.2	3.7	5.4	4.1	5.8	4.9	5.8	3.9	4.9	2.7	4.7	2.8
4. Nonpoverty, Nonrisk, Black Male	6.7	3.4	6.5	2.8	3.5	2.0	3.3	1.9	4.4	2.2	3.9	3.5
5. Poverty Level, Nonrisk, Black Female	7.9	9.8	8.0	6.3	10.1	7.6	9.7	4.9	9.8	10.7	9.6	5.3
6. Poverty Level, Nonrisk, Black Female	13.4	4.2	13.9	3.7	14.8	5.5	14.9	3.6	15.1	5.9	14.8	3.6
7. Nonpoverty, Academic Risk, Black Female	5.6	3.5	5.4	3.7	4.0	2.0	3.8	2.3	4.1	2.7	3.9	2.9
8. Nonpoverty, Nonrisk, Black Female	10.0	2.8	10.0	2.5	6.5	2.5	6.0	3.5	7.2	3.3	6.9	3.4
9. Poverty Level, Academic Risk, White	3.6	7.6	3.9	4.2	4.1	5.4	4.7	4.8	4.0	6.3	4.5	4.5
10. Poverty Level, Nonrisk, White	4.2	6.5	4.1	7.0	6.8	6.5	7.3	5.6	6.8	7.7	7.3	6.3
11. Nonpoverty, Academic Risk, White	3.1	11.0	3.4	14.8	2.6	12.9	2.9	16.4	2.4	13.4	2.6	18.1
12. Nonpoverty, Nonrisk, White	2.1	18.3	2.3	27.6	4.3	16.7	4.3	25.9	3.6	19.2	3.8	31.1
13. Poverty Level, Academic Risk, Other	4.4	6.7	5.2	4.5	5.8	7.2	6.5	5.4	5.3	4.4	5.9	2.3
14. Poverty Level, Nonrisk, Other	8.1	4.5	6.8	4.2	7.0	4.4	7.2	3.2	6.0	3.7	6.3	2.3
15. Nonpoverty, Academic risk, Other	4.0	4.1	4.9	4.5	4.1	3.5	4.5	3.4	3.4	4.7	3.8	4.7
16. Nonpoverty, Nonrisk, Other	5.0	3.4	4.4	3.2	3.5	5.4	3.3	6.5	4.5	3.6	4.8	3.3
Number of Cases	521	706	3,113	506,889	1,329	708	8,036	429,126	1,592	731	9,757	390,020

NOTE: Percentages are computed within student group (UB or CS) within grade level and may not add to 100 percent due to rounding error.

[a] For fall 73 grade level classification, the most reliable grade level was used even if it was inconsistent with other indications of grade level.

[b] Weighted percentages are computed using raw sampling weights.

[c] For purposes of establishing categories, indeterminate poverty status is combined with nonpoverty, indeterminate academic risk status is combined with nonrisk, indeterminate sex is combined with female, and indeterminate race is combined with "other."

still differed on relevant preprocess and extraprocess variables was desirable, and other analyses were undertaken. These analyses were conducted after balancing had been performed, and, as such, the results reflect additional differences between the UB and CS group after correction for sex, race, poverty status, academic risk status, and grade level (in other words, residual differences).

1. Preprocess (Input) Differences

In Subsection II.A, differences between the two groups, before balancing, on five ninth grade academic measures were examined. Although observed differences were extremely small, the possibility existed that the differences would be larger after balancing. A subsequent examination of these variables revealed that this was not the case; in fact, the differences had become slightly smaller. The results of this analysis were so similar to those prior to balancing that they are not reported here.

Other comparisons of extraprocess differences between the total UB and CS groups were not possible using the subset of variables available in the Master File; however, a considerable number of preprocess measures were available for BSQ respondents. It should be recalled from Chapter 3, Section VI, that the BSQ respondent group, while constituting a large proportion of the total sample, was not representative of the total UB or CS populations. However, the bias introduced into this respondent group was hypothesized to cancel when comparisons between CS and UB groups were made. To the extent that such an hypothesis is true, examination of differences in BSQ respondent data will generalize to total UB and CS group differences.

Table 7.5 presents a comparison of UB and CS responses to item 11 of the BSQ, which requested information concerning the respondents' current (spring 1974) area of residence. The comparison was made after adjustment of the data by the balancing technique and further adjustment for instrument nonresponse. Also presented in Table 7.5 are the standard errors for the group differences for the percentages given. The places of residence of the two groups are strikingly similar, which is not too surprising given the sampling technique

Table 7.5

PERCENTAGES OF UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS LIVING IN SPECIFIC LOCATIONS

Location		Group			Standard Error of Difference
		UB		CS	
Model Cities Area	Indeterminate[a/]	29.8%		29.9%	b/
	Living in Location	19.3		22.4	2.6
Urban Renewal Area	Indeterminate[a/]	37.5		37.5	b/
	Living in Location	11.3		10.4	b/
Federal Housing Project	Indeterminate[a/]	29.7		28.0	2.4
	Living in Location	15.0		16.3	3.1
Indian Reservation	Indeterminate[a/]	31.4		31.3	b/
	Living in Location	4.4	*	0.5	1.3
Farm	Indeterminate[a/]	30.6		29.1	3.1
	Living in Location	10.5	*	7.4	1.2
Sample Size	Unweighted	2,610		1,611	
	Weighted	18,901		1,171,641	

NOTE: Reported percentages were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 11 of the BSQ. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

a/ Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

b/ Standard errors were not computed for absolute differences less than 1 percent.

used. It can be seen from Table 7.5 that statistically significant differences exist only for the locations of "Farm" and "Indian Reservation," with greater proportions of the UB group residing in these areas. To some extent these findings may be attributable to the definition of feeder schools (see Chapter 2, Section IV) and to the fact that no BIA reservation schools were selected. It may be, however, that there are proportionally greater numbers of the UB population living in these areas, even after balancing.

These comparisons are somewhat attenuated by large proportions of indeterminate responses (approximately 30 percent in most cases). Since, however, the proportions of indeterminate responses are quite similar for the UB and CS group, it is relatively safe to assume that any nonresponse bias is similar for the two groups. If this is the case, then the comparisons are, in fact, valid. If this is not the case, then the differential allocation of the indeterminate responses could create statistically significant differences where none are present in Table 7.5 (or no difference, where statistically significant ones now exist). All things considered, however, the results in Table 7.5 suggest that the two groups do, in fact, differ in terms of proportions living in rural areas and on Indian reservations (implying also that the groups may differ in terms of proportion of Native Americans).

Table 7.6 presents the distribution of highest educational attainment of parents in the UB and CS groups (item 17 of the BSQ). Due to the marked similarity between the groups of the distributions of parental education for both mother and father, no standard errors were computed. Although indeterminate data account for upward of 15 percent of the responses in some cases, it is quite reasonable to assume from the available results that there are no substantive differences between the two groups in terms of the educational levels of their parents.

Table 7.7 shows the distribution of parents' occupations for the UB and CS groups (item 18 of the BSQ). The distribution of mothers' occupations is strikingly similar for the two groups and standard

Table 7.6

EDUCATIONAL ATTAINMENT OF PARENTS OF UB PARTICIPANTS AND COMPARISON STUDENTS

Level of Educational Attainment	Father		Mother	
	UB	CS	UB	CS
Indeterminate[a/]	15.7%	15.3%	6.2%	10.7
Some grade school or less	13.7	11.8	8.0	7.5
Finished grade school	9.8	8.4	9.5	8.9
Did not complete high school	26.6	26.5	29.6	32.2
Finished high school or equivalent	21.2	21.8	29.1	24.2
Some business, vocational, technical, or trade school	3.1	2.6	3.1	2.2
Finished business, vocational, technical, or trade school	2.1	2.8	3.6	3.5
Some college (including two-year degree)	4.1	3.6	6.7	4.9
Finished college (four- or five-year degree)	2.6	4.9	2.5	3.4
Attended graduate or professional school but did not receive degree	0.3	0.6	0.8	0.6
Obtained graduate or professional degree	0.8	1.6	0.9	1.8

NOTE: Reported percentages were computed using weighted data, after balancing and adjustment for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 17 of the BSQ. Sample sizes are the same as that reported in Table 7.5. Standard errors were not computed due to the marked similarity of the distributions.

[a/] Indeterminate response represents item nonresponse, multiple response, and inconsistent responses.

Table 7.7

OCCUPATIONAL LEVEL OF PARENTS OF UB PARTICIPANTS AND COMPARISON STUDENTS

Parents' Occupational Level	Father UB	Father CS	Father Standard Error of Difference	Mother[a] UB	Mother[a] CS
Indeterminate[b]	22.1%	18.4%	2.9	18.6%	19.9%
Laborer or Service Worker	51.1 *	44.9	2.1	26.4	23.6
Craftsman or Foreman	14.9 *	18.5	1.7	1.8	1.7
Office or Sales	3.8 *	6.6	1.1	8.6	9.1
Manager or Owner	3.5 *	6.7	1.3	1.9	1.9
Professional or Technical	4.1	4.7	c/	8.3	10.6
Homemaker or Housewife	0.5	0.2	c/	34.5	33.2

NOTE: Reported percentages were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 18 of the BSQ. Sample sizes are the same as those reported in Table 7.5. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Due to the marked similarity of the distribution of responses between the UB and CS groups, standard errors of difference were not computed.

[b] Indeterminate response represents item nonresponse, multiple response, and inconsistent responses.

[c] Standard errors were not computed for absolute differences of less than 1 percent.

errors were therefore not computed. For fathers' occupations, however, statistically significant differences between the groups were observed. The occupational level of the fathers of the UB group shows greater concentration in the Laborer or Service Worker area than that for fathers of the CS group and, conversely, less concentration in the fathers of Craftsman, Foreman, Office Worker, Salesperson, Manager, or Owner. This basic pattern indicates a lower occupational level for the fathers of the UB group, which is probably indicative of lower socioeconomic status.

In terms of the preprocess measures that have been examined, it is clear that all input differences between the UB and CS groups have not been resolved by balancing. The UB group has a statistically significant greater representation of rural students and students living on Indian Reservations. There is also an indication that even though the two groups were balanced on the crude index of poverty status, differences still exist in socioeconomic status (as reflected in the lower level of fathers' occupation in the UB group).

The practical significance of these differences is yet another matter. Though socioeconomic status and location of residence are theoretically related to academic achievement and attitudinal measures, identified empirical relationships have not been extremely large. Coupled with the small absolute differences between the two groups on these variables, the impact of such differences in the output measures to be considered should be minimal. The basic caution addressed to the reader, by these relatively small but statistically significant differences in preprocess measures between the UB and CS group, is that small differences in output measures should be interpreted with care, since they may be attributable to input differences rather than process operation. Theoretically, the net effect of the input differences discovered should result in a bias which operates in favor of the CS group. In other words, the CS group should show higher levels for the academic achievement measures simply because of input differences, all other factors being equal.

2. Extraprocess (Other External Process) Differences

No data regarding the operation of other external processes were available for the entire sample; however, such information was available for the subset of BSQ respondents. These data were analyzed and the results presented below are subject to the same considerations in interpretation as noted in the previous subsection.

Table 7.8 presents information pertaining to HS course of study and participation in intervention programs, other than UB, for the CS and UB respondents to the BSQ. Small but statistically significant differences exist between the two groups in terms of pre-process courses of study. UB participants report greater participation in an academic-related course of study and less in a vocational/business course of study. This finding is somewhat confounded by the difference between the groups in percentage of indeterminate data. Differential within-group distribution of the indeterminate data among the other response categories could, theoretically, reduce (or even reverse the direction of) the observed differences.

Participation in Talent Search (TS), another of the TRIO Programs, is quite limited for both groups, and group differences in such participation is not statistically significant. Considering other intervention programs[17/] (exclusive of TS and UB), over half of the members in each group report no participation. Although differences in percentage participation are small for the categories reported in Table 7.8, the average number[18/] of other programs in which UB students have participated is significantly (over three standard errors) greater than that for the CS group; however, the absolute difference is quite small and the practical significance of this difference is questionable.

[17/] These programs, listed in item 24 of the BSQ (Appendix D), include College Readiness, College Bound, Aspira, Educational Opportunity Program, Cooperative Vocational Education Program, Neighborhood Youth Corps, and others.

[18/] Mean number of programs in which students had participated was computed for determinate responses only, without adjustment for item nonresponse.

Table 7.8

PREVIOUS HIGH SCHOOL COURSE OF STUDY AND PARTICIPATION IN INTERVENTION PROGRAMS FOR UB PARTICIPANTS AND COMPARISON STUDENTS

Variable Considered	Responses	Group		Standard Error
		UB	CS	
Ninth Grade Course of Study	Indeterminate[a]	10.7% *	15.3%	2.1%
	General	46.5	42.2	2.9
	Academic	32.8 *	25.3	3.1
	Vocational/Business	10.0 *	17.2	1.7
Previous Participation in Talent Search (TS)[b]	Indeterminate[a]	4.5	6.0	1.1
	No Participation	90.5	90.1	[c]
	Participation	5.1	3.9	1.2
Number of Other Intervention Programs (Exclusive of UB and TS) in Which Participated[b]	Indeterminate[a]	4.5	6.0	1.1
	0	51.4	55.2	
	1	26.6	24.7	
	2	9.0	6.8	
	3	3.7	4.6	
	4 or more	4.8	2.8	
	Mean[d]	0.867 *	0.720	.04

NOTE: Reported percentages were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from items 20 and 24 of BSQ. Sample sizes are the same as those reported in Table 7.5. An asterisk (*) is used to indicate statistically significant ($P < .05$) differences.

[a] Indeterminate response represents item nonresponse, multiple response, and inconsistent responses.

[b] For these variables, additional balancing over grade was performed.

[c] Standard errors were not computed for differences of less than 1 percent.

[d] Means computed for determinate responses only.

The functions of the various other programs in which students participated are so diverse as to make a simple count of the number of such programs a relatively weak measure of difference in extraprocess variables. A more meaningful measure, related to the services received from such other programs, is available from responses to item 25 of the BSQ. The services listed in that item could be meaningfully grouped into one of four categories: (a) academic-related (tutoring, class work); (b) counseling; (c) vocational training; and (d) financial assistance. Percentages of the UB and CS group receiving such services are given in Table 7.9. There are no significant differences in the relative frequency of receipt of these external services by the two groups.

In summary, there are few statistically significant differences and no practically significant differences between the two groups in terms of other intervention programs. Small but statistically significant differences exist in terms of preprocess course of school study. The direction of these differences suggests that UB students (with greater early participation in an academic-oriented curriculum) may have a higher preprocess motivation for continuing education.

Two of the major external processes which may operate on the student (namely the family and community atmosphere) were not treated in this study. Such differences would be reflected, however, in analyses presented in the previous subsection (i.e., type of community, parents' education, etc.).

3. Analysis Implications

While differences between the UB and CS groups in terms of variables common to all sampled students (Master File data) were statistically adjusted by the process of balancing (and as such should not represent a source of bias in subsequent analyses), other preprocess and extraprocess group differences were uncovered for the subsets of BSQ respondents. These differences were, in general, quite minor and should not therefore introduce any substantial amount of bias in the analyses reported below in this chapter.

There are, undoubtedly, other extraprocess variables on which these two groups differ. Since there are no measures of these

Table 7.9

PERCENTAGES OF UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS RECEIVING SPECIFIC SERVICES FROM INTERVENTION PROGRAMS OTHER THAN UPWARD BOUND

Type of Service[a]	Group		Standard Error of Difference
	UB	CS	
Academic-related[b]	18.0%	15.0%	1.8%
Counseling[c]	21.6	18.9	2.1
Vocational Training[d]	14.0	12.7	1.9
Financial Assistance[e]	9.4	10.8	1.4
Indeterminate[f]	5.6	7.9	1.3

NOTE: Reported percentages were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Sample sizes are the same as that reported in Table 7.5. None of the differences reported in this table are statistically significant ($P < .05$).

[a] Receipt of one type of service does not preclude receipt of some other type.

[b] Determined from response to items 25.1 and 25.2 of BSQ.

[c] Determined from response to items 25.3, 25.7, and 25.8 of BSQ.

[d] Determined from response to item 25.6 of BSQ.

[e] Determined from response to item 25.5 of BSQ.

[f] Indeterminate response is the same for all categories of services and represents complete nonresponse to all subitems of item 25 of BSQ.

variables, the nature of such differences and their possible influence on analysis results is a matter of speculation. In general, the two groups appear to be quite comparable after balancing is applied, and differences in outcome measures should be related primarily to UB participation rather than to the other factors which have been considered in this subsection.

III. DIFFERENCES IN EDUCATIONAL CONTINUANCE BETWEEN UB AND CS GROUPS

Two of the major objectives of the UB program (see Section I of this chapter) involve educational continuance, namely: (a) continuance in and completion of HS, and (b) PSE entry. The extent to which the program meets these objectives is the subject of this section. This evaluation was relatively straightforward, involving only measures that are extremely objective.

A. High School Continuance/Completion Within School Year

HS educational continuance with the 1973-74 school year was easily determined, as indicated in Section I of this chapter. Recalling that retrospective data regarding spring 1974 enrollment status were obtained in fall 1974 from students who had not responded to the spring 1974 questionnaire administrations, the results presented in this subsection should be relatively free of possible biases in the spring 1974 respondent group (see Chapter 3, Section VI).

Table 7.10 presents, within school year, HS continuance/completion rates for the UB and CS groups by grade level. In addition to presenting the total grade level rate for the UB group, Table 7.10 also provides continuance/completion rates within grade level by length of time in the UB program. There were, of course, some cases for which continuance/completion could not be determined (indeterminate responses). Three continuance/completion rates were therefore computed and are reported in Table 7.10. These three rates are: (1) maximum rate (P_{max}), computed by assuming that all indeterminate responses would have indicated continuance;

Table 7.10

FALL 73 TO SPRING 74 HIGH SCHOOL CONTINUANCE/COMPLETION RATES BY GRADE FOR UPWARD BOUND PARTICIPANTS AND COMPARISON GROUP

		Student Group					
Grade		UB in Program at Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS	Standard Error[a]
12	P_{max}[b]	98.6%	98.6%	95.8%	97.5%	96.8%	0.8%
	P_{min}[c]	98.0%	97.6%	93.8%	96.2%	95.2%	1.6
	N[d]	305	549	520	1374	723	--
	P_{adj}[e]	98.6%	98.5%	95.7%	97.4%	95.8%	1.4
	N[f]	303	544	509	1356	718	--
11	P_{max}[b]	97.8%	98.4%		98.3%*	93.1%	1.3
	P_{min}[c]	97.8%	97.2%		97.4%*	91.9%	1.6
	N[d]	300	844		1144	701	--
	P_{adj}[e]	97.8%	98.4%		98.3%*	93.0%	1.3
	N[f]	300	834		1134	690	--
10	P_{max}[b]	98.0%			98.0%*	93.4%	1.3
	P_{min}[c]	97.6%			97.6%*	92.4%	1.5
	N[d]	501			501	691	--
	P_{adj}[e]	98.0%			98.0%*	93.3%	1.3
	N[f]	499			499	684	--

NOTE: Values reported are based on weighted data, using balanced CS weights, and adjusting all weights for cases with indeterminate classification as to grade level or length of time in UB. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Standard errors presented are computed for the difference in rates between the total group of UB participants within a particular grade level and the analogous comparison group.

[b] Computed by assuming all indeterminate continuation cases as continuing or completed.

[c] Computed by assuming all indeterminate continuation cases as not continuing or completing.

[d] Unweighted cell size is computing P_{max} and P_{min}.

[e] Computed by adjusting weights for indeterminate continuation/completion cases.

[f] Unweighted cell size in computing P_{adj}.

(2) minimum rate (P_{min}), computed by assuming that all indeterminate responses would have indicated noncontinuance; and (3) an adjusted rate (P_{adj}), computed by adjusting for "item" nonresponse.[19] The values of P_{adj} are the best available single estimate of the continuance/completion rates, while P_{max} and P_{min} define upper and lower limits, respectively, of this estimate for these groups of respondents.

Regardless of the rate considered, within-year continuance/completion rate is quite high for all subgroups considered. For all grade levels the overall UB continuance/completion rate is higher than the CS rate; and for grade 12, the rate within the UB group increases with length of time in program.

Nine distinct subgroups are defined by the data presented in Table 7.10. Maintaining comparisons within grade level, only six independent comparisons of continuance/completion rates among these nine groups are possible. The a priori comparisons decided upon were: (1) total of UB twelfth graders compared with CS twelfth graders, (2) total of UB eleventh graders compared with CS eleventh graders, (3) UB tenth graders compared with CS tenth graders, (4) UB twelfth graders who joined the program in grade 11 or earlier compared with UB twelfth graders joining the program in grade 12, (5) UB twelfth graders who joined the program in grade 10 or earlier compared with UB twelfth graders joining the program in grade 11, and (6) UB eleventh graders who joined the program in grade 10 or earlier compared with UB eleventh graders joining the program in grade 11. The first three listed comparisons examine differences between the total UB and the CS group within a particular grade, while the remaining comparisons examine differences within the UB group and a particular grade level as a function of length of participation.

The standard errors presented in Table 7.10 relate to the differences between the total UB group and the CS group for a given grade level. The greater within-year continuance/completion rate experienced by UB participants is statistically significant for grades 10 and 11, but not for grade 12. Standard errors for the comparisons within the UB group are presented in Table 7.11. From Table 7.11, it can be seen that only one such comparison yields a statistically significant difference. UB participants who join the program in grade 12 have lower continuance/completion rates than those who joined the program during the eleventh grade or earlier.

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[19] The adjustment was accomplished by distributing the weights of students with indeterminate responses to those students who were similar (in the same balancing category, same project--or school--and same grade). See Appendix F for a more detailed description of weight adjustments.

B. High School Continuance/Completion Across School Year

Within school year continuance does not, of course, insure that the student will return for the following academic year, since dropout can occur during the summer vacation between academic years. Summer dropout can also occur for those students who continued in school during their senior year but who failed to graduate. For this reason, additional examination of continuance/completion rates from one school year to the next was undertaken. These analyses required differential adjustment for nonresponse due to the subsampling conducted during the fall 1974 data collection period.[20/]

Full year (fall to fall) continuance/completion rates for the UB and CS groups, by grade and by length of exposure to the UB program, are given in Table 7.12. The pattern of fall to fall continuance/completion is considerably different from that for fall to spring; full year continuance/completion rates are lower, as would be expected. For the CS group there is a considerably larger range of P_{max} and P_{min} within grade level than for the UB group. The range of P_{max} and P_{min} for the CS group fall to fall continuance is also noticeably greater than the analogous range observed when considering fall to spring continuance. This is a reflection of a higher proportion of indeterminate responses for the CS group for the full year continuance measure.

Standard errors reported in Table 7.12 are related to the differences in rates for the total UB and CS groups for specified grade levels. As can

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[20/] Since previous nonrespondents (with considerably higher dropout rates) were followed up with certainty and previous respondents were subsampled for followup, adjustment for indeterminate response without regard to previous response status would have spuriously deflated the continuance rates. See Appendix F for details of weight adjustments.

Table 7.11

DIFFERENCES IN FALL 1973 TO SPRING 1974 HIGH SCHOOL CONTINUANCE/COMPLETION RATES BY GRADE FOR UB PARTICIPANTS AS A FUNCTION OF LENGTH OF PARTICIPATION

UB Student Groups Compared			Difference[a]	Standard Error
Twelfth graders joining program in grade 11 or earlier	Twelfth graders joining program in grade 12	P_{max}[b]	2.8% *	1.2%
		P_{min}[c]	3.9 *	1.4
		P_{adj}[d]	2.8 *	1.2
Twelfth graders joining program in grade 10 or earlier	Twelfth graders joining program in grade 11	P_{max}[b]	0.0	—
		P_{min}[c]	0.4	1.3
		P_{adj}[d]	0.1	1.0
Eleventh graders joining program in grade 10 or earlier	Eleventh graders joining program in grade 11	P_{max}[b]	-0.6	1.2
		P_{min}[c]	0.6	1.5
		P_{adj}[d]	-0.6	1.2

NOTE: Values reported are based on weighted data adjusted for cases with indeterminate classification as to grade level or length of time in UB. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Difference reported is determined by subtracting rate of second group listed from rate of first group listed. As such, a positive difference reflects a higher continuance/completion rate for the first group listed and a negative difference reflects a lower rate for the first group listed.

[b] Computed by assuming all indeterminate continuation cases as continuing or completed.

[c] Computed by assuming all indeterminate continuation cases as not continuing or completing.

[d] Computed by adjusting weights for indeterminate continuation/completion cases.

Table 7.12

FALL 73 TO FALL 74 HIGH SCHOOL CONTINUANCE/COMPLETION RATES BY GRADE FOR UPWARD BOUND PARTICIPANTS AND COMPARISON GROUP

Grade		Student Group					Standard Error[a]
		UB in Program at Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS	
12	P_{max}[b]	88.8%	89.4%	89.4%	89.3%	91.1%	2.2%
	P_{min}[c]	86.2%	87.4%	85.4%	86.4%	81.6%	3.1
	N[d]	216	411	436	1063	549	--
	P_{adj}[e]	88.5%	89.0%	88.9%	88.8%	90.1%	2.5
	N[f]	214	405	421	1040	496	--
11	P_{max}[b]	91.1%	91.7%		91.6%	92.4%	2.2
	P_{min}[c]	83.5%	85.8%		85.3%	80.5%	2.5
	N[d]	228	738		966	557	--
	P_{adj}[e]	90.7%	91.4%		91.3%	91.3%	2.3
	N[f]	210	691		901	472	--
10	P_{max}[b]	93.5%			* 93.5%	86.6%	3.4
	P_{min}[c]	89.5%			* 89.5%	79.1%	4.1
	N[d]	413			413	571	--
	P_{adj}[e]	93.4%			* 93.4%	85.5%	3.7
	N[f]	392			392	522	--

NOTE: Values reported are based on weighted data, using balanced CS weights, corrected for fall 1974 subsampling and adjusted for cases with indeterminate classification as to grade level or length of time in UB. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Standard errors presented are computed for the difference in rates for the total group of UB participants within a particular grade level.

[b] Computed by assuming all indeterminate continuation cases as continuing or completed.

[c] Computed by assuming all indeterminate continuation cases as not continuing or completing.

[d] Unweighted cell size in computing P_{max} and P_{min}.

[e] Computed by adjusting weights for indeterminate continuation/completion cases.

[f] Unweighted cell size in computing P_{adj}.

be seen, significantly higher rates exist for the UB group in the tenth grade on all three estimates (P_{max}, P_{min}, and P_{adj}). UB and CS continuance/completion rate differences for eleventh and twelfth graders are mixed (reflecting, in part, the fluctuation of P_{max} and P_{min} in the CS group), but none of the differences approach statistical significance.

As in the previous subsection, three comparisons for each of the three rates were made within the UB group to discover a possible relationship between length of program participation and HS educational continuance. No such relationships were found (the maximum absolute difference observed was 2.3 percent and the minimum standard error computed was 2.6 percent), and the results of these analyses are not reported.

While the fall to fall continuance rates are less stable (larger standard errors due to smaller number of cases) and subject to some possible bias (as specified in Chapter 3, Section VI), it is somewhat surprising that full year high school continuance does not appear to be related to extent of UB participation except for the tenth graders. The finding is more surprising in light of the emphases placed by the UB program on concentration of efforts within eleventh and twelfth grade and on the summer component of the program. It is precisely in these areas of concentration that the program seems weakest with respect to HS continuance. (Note that previously established continuance/completion advantages for eleventh grade UB participants within the academic year dissipate when full year rates are considered. This suggests, of course, that the summer dropout rate for these UB participants is greater than that for the CS group.) Unfortunately, it is not possible to compute, from available data, separate continuance/completion rates for the subset of UB participants who actually were enrolled in the 1974 UB summer program. Consequently, the hypothesis that UB students who actually participate in the summer program do persist at higher rates than do the CS group counterparts could not be explored. Even if this hypothesis were true, the fact remains that UB participants (in general) do not continue (or complete) HS education on a year-to-year basis at any higher rate than a comparable group of nonparticipants.

C. PSE Enrollment

Differences in PSE entry rates may be considered more or less independently of difference in high school continuance by appropriately defining the population of students eligible for PSE entry. One such subpopulation of students is made up of high school graduates. Regardless of high school completion (except in the case of 0 percent completion), PSE entry rates for UB and CS subgroups of this population can be computed and compared. Another population of eligibles may be defined in light of the current trends toward "open door" postsecondary institutions for which high school graduation is not a necessary requisite for admission. The second population is thus defined as all students not in high school; the former group (high school graduates) is a proper subset of the latter. PSE entry rates were determined for both such subgroups (i.e., UB and CS students who had graduated from high school by fall 1974, and UB and CS students no longer in high school in fall 1974).

PSE entry rates for the total subgroups of UB and CS eligibles are given in Table 7.13. Due to the large percentage of indeterminate responses, the only rates given are those in which weight adjustments for indeterminate response were made (analogous to the P_{adj} values for HS continuance). For the HS graduate subgroup, the rates are further partitioned by length of participation in the UB program. Differences between UB and CS groups in PSE entry rates are conspicuously large. Not only is the entry rate significantly greater for the UB group in a statistical sense, it is also of considerable practical significance due to the absolute magnitude of the difference. Among high school graduates, less than half of the CS group enter PSE as compared to almost three-fourths of the UB participants. Among the all eligible group (including high school dropouts), it is estimated that 13 of 20 UB students enter PSE, as compared to 8 of 20 in the balanced CS group.

Within the UB HS graduate subgroup, two additional independent a priori comparisons were made. High school graduates who had joined UB in or prior to the eleventh grade continued into PSE at a 4 percent higher rate than those joining in the twelfth grade, but this difference was not statistically significant when compared to a standard error of 4.1 percent. Graduates who had joined UB prior to or in the tenth grade entered PSE at an 8.9 percent higher rate than those joining in the eleventh grade, which did represent a statistically significant difference with an associated standard error of 3.6.

Table 7.13

POSTSECONDARY ENROLLMENT RATES FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Population Considered		Group					Standard Error[a]
		UB in Program in Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS	
High School Graduates[b]	Rate	78.1%	69.2%	68.2%	* 70.7%	46.7%	5.3%
	N[c]	191	366	343	900	413	
All Eligibles[d]	Rate				* 65.1%	42.5%	4.6%
	N[e]				1135	618	

NOTE: Reported percentages are based on weighted data, using weights balanced within grade level, corrected for fall 1974 subsampling, and adjusted for cases with indeterminate classification as to grade level or length of time in UB. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Standard errors presented are computed for the difference in rates for the total group of UB participants within a particular grade level.

[b] Reported rate represents PSE entry during or prior to, fall 1974 for students classified as high school graduates in fall 1974.

[c] Unweighted cell sizes.

[d] Reported rate represents PSE entry during, or prior to, fall 1974 for all members of the sample classified as not in high school in fall 1974. For these computations, weights were also balanced over grade level. Cases with indeterminate PSE entry status (less than 0.1 percent and 0.3 percent, respectively, of the UB and CS weighted totals) were assumed not to have entered PSE.

UB participation, therefore, seems highly related to PSE entry, in both a qualitative and quantitative sense. Program participation, regardless of length of such participation[21/], is strongly related to an enhanced PSE entry rate. Further, among those who complete high school, PSE entry rate is positively related to length of participation in the program.

It should be pointed out that the PSE entry rates reported in Table 7.13 reflect, for the greater part, immediate PSE entry (i.e., entry into PSE within a year of graduation or dropout). Higher levels of "lag entry" rates among the CS group (i.e., entry into PSE over a longer time spa[illegible] could reduce the original advantage of the UB participants. The data [illegible] this study do not, however, allow examination of this possibility or of other hypotheses regarding lag entry. Furthermore, data are not available from the current study to assess the PSE persistence within the two groups. That is, it is _possible_ that the UB participants entering PSE do not remain there at as high a rate as the CS PSE entrants. Were this the case, PSE _completion_ for the two groups could be equivalent or even greater for the CS group. The likelihood of such a possibility is, however, another matter, and without empirical evidence, any discussion of such likelihood would be little more than speculation.

For the particular PSE entry rate employed in this study, the picture is quite clear. Participation in the UB program is highly related to a greater rate of entry into PSE. These results cannot be attributed to differences between the UB and CS groups in terms of differences in school-specific factors, academic risk status, poverty status, race, or sex, since these factors were controlled either in the study design or statistically through the balancing procedures. Other observed differences between the UB and CS groups for which statistical adjustments were not made (see subsection II.C of this chapter) could not explain differences in PSE entry rate of the direction and magnitude of those reported in Table 7.13, since the observed preprocess and extraprocess differences were typically quite small and in a direction which should have favored the CS group over the UB group. Moreover the differences cannot be plausibly explained by the

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[21/] For most of the UB sample, participation consisted of at least one academic year.

fact that indeterminate response to PSE status in fall 1974 was fairly high. Possible bias due to nonresponse to the fall 1974 data collection (primarily through the subsampling scheme used) was pointed out in Chapter 3, section VI; however, given the small extent of this possible bias it is extremely unlikely that it could account for the substantial differences in PSE entry rate, even in the event that the bias was operating differentially for the UB and CS groups. There is always the possibility in survey studies of this type, however, that overlooked or unmeasured (and therefore uncontrolled) variables have confounded the results.

Since results are based primarily on unverified student reports, another possible explanation of the findings would be response bias on the part of students. To advance this as a tenable hypothesis for group differences, one would have to argue for differential response bias in the two groups. Given the loyalty of UB participants to their program, such arguments do have some intuitive appeal. Since some student reports were subjected to validation, and no differential response validity between the UB and CS groups was observed, explanations based on differential response bias are more tenuous.

There are two remaining plausible explanations for this finding. The first, and perhaps most obvious explanation, is that participation in the UB program raises the probability of PSE entry. The second explanation is that some unmeasured variable, which is highly related to PSE entry, is a major factor in selection of students into the program. One such variable may be high motivation for educational continuance beyond high school. Some insight into this latter possible explanation will be gained in subsequent sections of this chapter.

D. Longitudinal Educational Continuance

It is possible, by use of the Markov model for educational continuance introduced in Chapter 2, subsection II.B, to examine long-term educational continuance for the UB and CS groups. This use of synthetic cohorts allows computation of high school graduation rate, given tenth grade entry, for various UB entry patterns. These values were computed and are presented in Table 7.14. The high school graduation probabilities shown in Table 7.14

Table 7.14

PROBABILITIES OF HIGH SCHOOL COMPLETION AND PSE ENTRY, GIVEN TENTH GRADE ENTRY, AS A FUNCTION OF DEGREE OF EXPOSURE TO UPWARD BOUND

	Exposure to UB			
	3 or More Years (Entered UB in Grade 10 or Earlier)	2 Years (Entered UB in Grade 11)	1 Year (Entered UB in Grade 12)	No Exposure (CS)
High School Graduation:				
Probability	.750	.696	.694	.703
Difference[a/]	+.047	-.007	-.009	--
Standard Error of Difference	.060	.042	.049	--
PSE Entry:				
Probability[b/]	.602	.527	.472	.316
Difference[a/]	+.286 *	+.211 *	+.156 *	--
Standard Error of Difference	.052	.051	.049	--

NOTE: Probability values reported are computed by multiplying year-to-year continuance/completion rates, adjusted for indeterminate classification variables and continuance/completion index. The results reflect balancing of the CS group. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a/] Difference is CS group probability value subtracted from UB group probability value. Positive differences, therefore, are favorable to the UB group.

[b/] For twelfth graders, the probability of transition from twelfth grade to college is computed and multiplied by lower grade continuance rates. Probability values reported cannot, therefore, be exactly reconstructed from previously presented results.

may be computed directly (within rounding error) from the entries of Table 7.12.[22]

The probabilities of PSE entry, given tenth grade entry, cannot be obtained directly from information presented previously. Transition probabilities from tenth to eleventh grade and from eleventh to twelfth grade were obtained from Table 7.12 entries. The probabilities of PSE entry, given twelfth grade entry, were not, however, precisely equivalent to the values obtained by multiplying twelfth grade, fall-to-fall continuance rates by PSE entry rates among high school graduates.[23]

The information presented in Table 7.14 mirrors the findings previously reported. Probability of twelfth grade completion given tenth grade entry is not significantly related to UB participation, regardless of the extent of that participation. On the other hand, probability of PSE entry given tenth grade entry is significantly related to UB participation, and the extent of UB participation seems linearly related to an increase in this probability.

IV. DIFFERENCES BETWEEN CS AND UB STUDENTS ON FACTORS RELATED TO SUCCESS IN PSE

The third major objective of the UB program is to provide UB students with the skills and motivation necessary for success in PSE. As previously discussed in Chapter 1, subsection III.C.3, the extent to which the program is meeting this objective could not be directly evaluated due to difficulty in defining and/or measuring such variables. Success in meeting the objective may, however, be examined indirectly by examining differences between the UB and CS groups on factors theoretically and empirically related to success in PSE. Such an examination is the subject of this section.

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[22] For example, the probability of high school graduation given tenth grade entry and exposure to UB for 2 years (from grade 11 through graduation) is given as .696. This figure is obtained by multiplying: (1) probability of eleventh grade enrollment, given tenth grade entry and no UB participation in grade 10 (i.e., CS); (2) probability of twelfth grade enrollment, given eleventh grade entry and UB participation in grade 11; and (3) probability or twelfth grade completion, given twelfth grade entry and participation in UB during eleventh and twelfth grades. Performing the multiplication with the P_{adj} rates yields (.855) x (.914) x (.890) = .6955.

[23] This is due to the fact that some twelfth graders did not graduate but did continue in high school.

A. Academic Factors

HS academic measures are generally quite predictive of success in PSE. Specifically examined in this subsection are three of the change measures defined in section I of this chapter: (1) change in academic grade point average, (2) change in proportion of academic credits passed, and (3) change in proportion of credits taken that could be classified as academic.[24] The first and second variables listed above are indices of changes in high school academic achievement. It seems reasonable that a program attempting to recruit high risk students and to provide them with skills necessary for success in PSE would attempt to improve such achievement. The third variable is an index of course load concentration. In preparation for entry to 2- and 4-year colleges (stressed by the UB program) it would seem reasonable to emphasize a greater concentration of courses in the academic area.

The results of analysis of these variables are presented in Tables 7.15, 7.16, and 7.17. Little in the way of conclusion can be drawn from the results due to the extremely high incidence of indeterminate data.[25] Although the differences in indeterminate data percentages are not statistically significant for the UB and CS groups (or for different subgroups of

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[24] The other change scores discussed in section I showed such small variation that they were not analyzed.

[25] The extent of the indeterminate data problems shown in Tables 7.15 through 7.17 may be somewhat surprising in light of the extremely high return rates (over 99 percent) of these forms. Indeterminate response for these data is, however, compounded by many factors. First, access to transcript files was, in some cases, refused (although other information reported on the STF was available). Second, incomplete data were provided on many forms (due to lack of information on transcripts regarding "current" grade course averages). Finally, the algorithm for reducing the available STF data produced indeterminate data if too few academic credits were attempted, or if too few courses could be classified as either academic or nonacademic, or if grading systems were not amenable to the normalizing conversion used (see Appendix E).

Table 7.15

CHANGE IN ACADEMIC GRADE POINT AVERAGE FROM NINTH GRADE TO CURRENT GRADE FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Current Grade		Student Group				
		UB in Program at Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS
12	Indeterminate[a]	54.2%	54.1%	59.9%	56.4%	45.7%
	N[b]	162	305	328	795	348
	Mean Change[c]	-0.017	0.025	0.156	0.062	-0.001
	N[d]	143	244	192	579	375
11	Indeterminate[a]	47.1%	49.0%		48.5%	41.7%
	N[b]	143	447		590	279
	Mean Change[c]	-0.117	-0.048		-0.066	-0.157
	N[d]	157	397		554	422
10	Indeterminate[a]	40.6%			40.6%	42.5%
	N[b]	197			197	248
	Mean Change[c]	-0.147			-0.147	-0.121
	N[d]	304			304	443

NOTE: Percentages and means reported are based on weighted data, after balancing.

[a] Percentage of indeterminate responses, representing item nonresponse, multiple response, and inconsistent response.

[b] Number of cases with indeterminate responses.

[c] Computed for determinate responses only.

[d] Number of cases with determinate responses.

Table 7.16

CHANGE IN PROPORTION OF ACADEMIC CREDITS PASSED FROM NINTH GRADE TO CURRENT GRADE FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Current Grade		Student Group				
		UB in Program at Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS
12	Indeterminate[a/]	46.0%	43.5%	48.0%	45.7%	33.5%
	N[b/]	136	246	273	655	221
	Mean Change[c/]	-0.013	-0.040	-0.007	-0.022	-0.028
	N[d/]	169	303	247	719	502
11	Indeterminate[a/]	44.2%	44.0%		44.0%	36.0%
	N[b/]	135	409		544	220
	Mean Change[c/]	-0.027	-0.033		-0.031	-0.099
	N[d/]	165	435		600	481
10	Indeterminate[a/]	35.4%			35.4%	40.1%
	N[b/]	172			172	196
	Mean Change[c/]	-0.095			-0.095	-0.082
	N[d/]	329			329	495

NOTE: Percentages and means reported are based on weighted data, after balancing.

a/ Percentage of indeterminate responses, representing item nonresponse, multiple response, and inconsistent response.

b/ Number of cases with indeterminate responses.

c/ Computed for determinate responses only.

d/ Number of cases with determinate responses.

Table 7.17

CHANGE IN PROPORTION OF ACADEMIC CREDITS TAKEN FROM NINTH GRADE TO CURRENT GRADE FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Current Grade		Student Group				
		UB in Program at Grade 10	UB Joining Program in Grade 11	UB Joining Program in Grade 12	UB Total Group	CS
12	Indeterminate[a]	45.8%	42.3%	47.0%	44.9%	32.2%
	N[b]	135	240	267	642	207
	Mean Change[c]	-0.042	-0.094	-0.096	-0.084	-0.114
	N[d]	170	309	253	732	516
11	Indeterminate[a]	43.8%	43.8%		43.8%	35.4%
	N[b]	134	407		541	213
	Mean Change[c]	0.022	-0.045		-0.033	-0.077
	N[d]	166	437		603	488
10	Indeterminate[a]	34.6%			34.6%	39.5%
	N[b]	167			167	191
	Mean Change[c]	-0.021			-0.021	-0.038
	N[d]	334			334	500

NOTE: Percentages and means reported are based on weighted data, after balancing.

[a] Percentage of indeterminate responses, representing item nonresponse, multiple response, and inconsistent response.

[b] Number of cases with indeterminate responses.

[c] Computed for determinate responses only.

[d] Number of cases with determinate responses.

UB participants) in the huge majority of possible comparisons, it is not statistically sound to base conclusions on results which represent less than half of the available cases (regardless of the extent of weight adjustment performed).

With the magnitude of indeterminate data shown in Tables 7.15 through 7.17, the mean change values reported (computed for determinate data only) could not be considered unbiased estimates unless the unrealistic assumption was made that students with available data were representative of those without such data. To the extent that such an assumption is false, the table entries could change considerably. There is, however, no support from the data for a relationship between UB participation and change in academic-related factors. In fact, for some comparisons, the results are not even in the expected direction. The picture painted by Tables 7.15 through 7.17 is, perhaps, a surprising one, showing a general slight decrease in academic success and percent of academic credits taken from grade nine to current grade for both the UB and CS groups. This pattern is quite consistent regardless of the student subgroup considered; however, the meaningfulness of these changes is in question, given their small absolute value and the extent of indeterminate responses.

B. Aspirations and Expectations

Of the many motivational aspects related to PSE success, two of the easiest to measure are plans and expectations. Part of the UB program function is to raise participants' aspirations to attend college and to provide them with reasonable expectations that these aspirations will be met. This aspect of UB function may be examined for the subset of BSQ respondents.

Table 7.18 presents the stated plans for entry into PSE (BSQ item 36) for BSQ respondents in the UB and CS groups, by grade level. The proportion of indeterminate data is low and quite similar for both groups, thus the results should not be greatly attenuated as a result of nonresponse. For every grade level considered, UB participants plan PSE entry at significantly higher rates than their CS counterparts. (The results presented previously in section III.C show that these plans are, in fact, realized for a large proportion of the UB group).

Table 7.18

PLANNED ENTRY INTO POSTSECONDARY EDUCATION WITHIN FOUR YEARS FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS BY GRADE IN SCHOOL

Fall 73 Grade Level[a]	Entry Plans	Group		Standard Error of Difference
		UB	CS	
12	Plans to enter	86.2% *	72.2%	4.1
	Does not plan to enter	8.6 *	22.3	4.0
	Indeterminate[b]	5.2	5.5	[c]
11	Plans to enter	82.2 *	63.5	3.7
	Does not plan to enter	12.4 *	29.3	4.3
	Indeterminate[b]	5.4	7.2	1.8
10	Plans to enter	76.3 *	64.3	4.2
	Does not plan to enter	13.8 *	28.7	3.1
	Indeterminate[b]	9.9	7.0	2.2

NOTE: Reported percentages were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 36 of the BSQ. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a] Determined from most reliable data source available in master file.

[b] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

[c] Standard errors were not computed for absolute differences less than 1 percent.

Table 7.19 shows the highest level of educational attainment toward which the two groups of BSQ respondents aspire, as well as the level of education they actually expect to attain (BSQ, item 30). Levels of indeterminate data are low and not statistically different for the UB and CS groups. Differences between the groups in both aspiration and expectation are statistically significant, and the patterns of responses clearly show that UB participants both aspire to and expect higher levels of education.

Another factor related to plans for educational continuance is occupational plans. Some occupations require a longer period of PSE (or different forms of PSE) than others. The occupational aspirations and expectations for the two groups of BSQ respondents (BSQ, item 34) are shown in Table 7.20. Although the proportions of indeterminate data are relatively high for these variables, they are not statistically different for the UB and CS groups. The UB group members desire and expect to be in occupations which require greater amounts of education beyond HS (e.g., professional positions requiring some graduate training, school teacher) at significantly greater rates than CS group members. Although this finding is somewhat clouded by the high rate of indeterminate data, it is completely consistent with previous findings.

In summary, it seems clear that UB participants plan and expect to attend PSE in greater proportions and for longer periods than the CS group. This greater motivation for education continuance after high school should be directly related to the higher incidence of PSE entry in the UB group. The question remains, however, as to whether this motivation was affected by the UB program. There is simply not enough available information from this study to determine whether the UB program was instrumental in raising participants' motivation to attend PSE or whether selection into the program is based to some extent on already extant motivation. The latter hypothesis is supported by reports of some project staff during site visitation.

C. Actions Taken in Preparation for PSE

The counseling components of many UB projects include direction in preparation for PSE. If such counseling is effective, it would be expected that UB participants would take more preparatory actions than members of

Table 7.19

HIGHEST EDUCATIONAL ATTAINMENT DESIRED AND EXPECTED FOR UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Highest Educational Attainment Level	Desired			Expected		
	UB	CS	Standard Error of Difference	UB	CS	Standard Error of Difference
Not finished high school	0.4%	0.9%	a/	0.7%	1.3%	a/
Finish high school	6.6	13.2	* 2.0%	11.6	22.3	* 2.1%
Training in military service	3.0	4.5	* 0.7	4.3	5.6	0.7
Vocational, technical, business, or trade school	7.0	15.3	* 1.8	8.8	13.2	* 2.2
Two-year or junior college	8.3	8.3	a/	13.7	14.8	a/
Four-year college	27.0	19.9	* 1.8	34.6	21.6	* 2.5
Graduate or professional school	41.0	31.0	* 2.1	20.3	16.6	2.6
Indeterminate[b/]	6.6	6.8	a/	5.9	4.6	1.0

NOTE: Reported percentages were computed using weighted data, after balancing within grade and over grade and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 30 of the BSQ. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a/] Standard errors were not computed for absolute differences less than 1 percent.

[b/] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

Table 7.20

DESIRED AND EXPECTED OCCUPATIONS OF UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Occupation[a/]	Desired			Expected		
	UB	CS	Standard Error of Difference	UB	CS	Standard Error of Difference
Clerical	5.7%	11.2%	* 1.4%	7.3%	12.7%	* 1.8%
Craftsman	3.2	8.2	* 1.8	3.0	8.8	* 1.5
Farm Work	0.1	0.3	b/	0.1	0.4	b/
Homemaker/Housewife	0.1	0.4	b/	1.4	1.8	b/
Laborer	0.0	0.6	b/	0.5	1.8	0.7
Manager/Administrator	2.4	3.4	b/	1.8	1.8	b/
Military	1.6	1.2	b/	1.9	1.7	b/
Operative[c/]	0.5	2.2	* 0.5	0.7	2.1	* 0.6
Professional I[d/]	26.3	22.9	2.4	21.8	18.4	1.9
Professional II[e/]	13.8	6.2	* 1.3	10.0	4.6	* 1.0
Proprietor/Owner	0.8	1.0	b/	0.4	0.5	b/
Protective Service	1.0	1.1	b/	1.0	0.9	b/
Sales	0.4	0.2	b/	0.5	0.7	b/
School Teacher	10.0	5.6	* 1.2	9.7	5.4	* 1.3
Service Worker	4.8	5.9	0.9	4.1	6.9	1.4
Technical	4.3	4.0	b/	3.7	3.0	b/
Indeterminate[f/]	25.1	25.7	b/	32.2	28.6	2.0

NOTE: Reported percentages were computed using weighted data, after balancing within grade and over grade and adjusting for instrument nonresponse, for that subset of students eligible for BSQ administration. Data presented in this table were obtained from responses to item 34 of the BSQ. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a/] For more detailed descriptions of these categories, see BSQ item 34, Appendix D.

[b/] Standard errors were not computed for absolute differences less than 1 percent.

[c/] Such as meat cutter, machine operator, welder.

[d/] Professions typically requiring no more than a 4-year college education.

[e/] Professions typically requiring more than a 4-year college education.

[f/] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

the CS group. Some insight into this aspect of UB operation may be gained by examining the responses of certain subsets of BSQ respondents, although the results should be viewed with more than usual caution.[26]

Item 38 of the BSQ requested information concerning whether students had taken any of nine specified actions[27] in preparation for possible PSE entry. This question was addressed only to that subset of BSQ respondents who stated plans for entry into PSE within a 4-year period. Table 7.21 shows the distribution of the number of actions taken by grade level for the UB and CS groups.[28] Percentages of indeterminate data for these responses are quite low and are not different for the UB and CS groups. It can be seen that for both eleventh and twelfth graders, UB participants have taken significantly greater numbers of preparatory actions, on the average, than have members of the CS group.

Items 40 and 41 of the BSQ requested information relative to actual application to PSE by the subset of BSQ respondents who were twelfth graders and who stated plans for PSE entry. The distribution of numbers of applications made by UB and CS group members is given in Table 7.22. The proportion of indeterminate data is extremely small within each group and is not differential between the groups. On the average, UB participants have made application to a significantly greater number of PSE institutions than have their CS cohorts.

Item 42 of the BSQ requested information concerning acceptance into PSE by the subset of BSQ respondents in the twelfth grade who reported both plans for PSE entry and application to at least one PSE institution.

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[26] The results reported in this subsection are based on a set of BSQ items that were part of a nested skip pattern. In such a pattern, the nature of the response to one of the items determines whether or not an individual will answer subsequent items. The number of individuals responding to an item will typically decrease for items that are more deeply nested in the skip pattern, and thus the subset of respondents on which a particular set of results are based will be specified.

[27] These actions included visits to a campus, taking admission tests, and formal and informal inquiries concerning various aspects of PSE entry (see Appendix D).

[28] Due to the small numbers of tenth graders who had taken any such actions, tenth grade results are not reported.

Table 7.21

NUMBERS OF PRELIMINARY ACTIONS TAKEN TOWARD PSE ENTRY BY UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS BY GRADE

Grade	Number of Actions Taken:	Group		Standard Error of Difference
		UB	CS	
12	Indeterminate[a]	2.1%	0.9%	0.6%
	0	0.9%	3.1%	
	1-2	2.2%	16.4%	
	3-4	7.3%	16.6%	
	5-6	22.7%	28.5%	
	7 or more	64.8%	34.5%	
	Mean[b]	6.86	5.17	* 0.27
	N[c]	1000	388	
11	Indeterminate[a]	4.4%	4.5%	[d]
	0	2.9%	10.6%	
	1-2	12.2%	24.3%	
	3-4	25.6%	30.0%	
	5-6	31.7%	22.2%	
	7 or more	23.2%	8.2%	
	Mean[b]	4.81	3.39	* 0.23
	N[c]	870	335	

NOTE: Reported values were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of 11th and 12th grade students eligible for BSQ administration and stating plans to enter PSE. Data presented in this table were obtained from responses to item 38 of the BSQ. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

[a] Indeterminate response represents complete item nonresponse, multiple response, and inconsistent response.

[b] Computed for determinate responses only.

[c] Unweighted cell sizes.

[d] Standard errors were not computed for absolute differences less than 1 percent.

Table 7.22

NUMBERS OF POSTSECONDARY INSTITUTIONS TO WHICH APPLICATIONS WERE MADE BY UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Number of Applications Made	Group		Standard Error of Difference
	UB	CS	
Indeterminate[a]	1.1%	0.4%	
0	20.2%	33.1%	
1	26.2%	39.3%	
2	12.1%	10.8%	
3	15.3%	7.7%	
4	7.2%	3.9%	
5	8.2%	3.3%	
6 or more	9.7%	1.6%	
Mean[b]	2.26	1.26	* 0.25
N[c]	980	383	

NOTE: Reported values are computed using weighted data, after balancing and adjusting for instrument nonresponses, for that subset of 12th graders eligible for BSQ administration, stating plans for PSE entry, and providing determinate response for item 38 of the BSQ. Data presented in this table were obtained from nonresponses to items 40 and 41 of the BSQ. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

[b] Computed for determinate responses only.

[c] Unweighted cell sizes.

Acceptance rates for the UB and CS groups are presented in Table 7.23. Although the acceptance rate for the UB group is higher by almost 10 percent than that for the CS group, the difference is not a statistically significant one.

In summary, these data support the hypothesis that the UB program is facilitating actions taken in preparation for PSE entry, including application. Differences between the two groups in motivation to attend PSE, discussed in the previous subsection, have been eliminated to some extent by restricting these analyses to the subset of students planning PSE entry. Because of the restriction to this subgroup, quantitative motivational differences cannot provide a plausible alternative explanation of this finding, although qualitative differences in degree of desire to attend PSE may still exist. While preparatory actions and application rates are higher in the UB group, actual acceptance into PSE _among those students who apply_ is not significantly greater for UB participants. The major function of the UB program in this area, therefore, appears to be that of aid in the initiation of actions leading to admission rather than aid in gaining admission once application has been made. It should be noted, however, that the UB program is working with large proportions of "high risk" students. The higher application rate among UB participants, would, therefore, likely include among the group of UB applicants greater proportions of these high risk students than among the CS applicants. If this is the case, then even a similar acceptance rate for UB participants would suggest that the UB program _is_ facilitating PSE admission among those who apply. Moreover, the time frame in which data relating to PSE admission were obtained (April and May BSQ administrations) somewhat clouds the question of admission rates among applicants. It is likely that some additional UB applicants and CS applicants were accepted during the late spring and summer for admission to PSE for the following fall semester.

D. Availability and Adequacy of Financial Aid for PSE

Obtaining adequate financial aid is clearly a necessary condition for poverty level students to attempt (much less succeed in) PSE. The UB program is intended to assist participants in applying for and obtaining

Table 7.23

ACCEPTANCE INTO PSE OF UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

	Group		Standard Error of Difference
	UB	CS	
Not Accepted	17.8%	27.9%	5.9%
Accepted	76.9%	68.9%	5.8
Indeterminate[a/]	5.3%	3.2%	1.7
N[b/]	779	237	

NOTE: Reported values were computed using weighted data after balancing and adjusting for instrument nonresponse for that subset of twelfth graders eligible for BSQ administration and stating application to one or more PSE institutions. Data presented in this table were obtained from nonresponses to item 42 of the BSQ. None of the differences reported in this table are statistically significant (P < .05).

[a/] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

[b/] Unweighted cell sizes.

adequate financial aid packages. If this function of UB is being successfully effected, then UB participants who have applied to PSE institutions should also apply for financial aid in greater proportions than the analogous CS group members. Moreover, of those applying for aid, UB participants would be expected to obtain adequate aid in greater relative numbers.

Table 7.24 presents data pertaining to application for, offer of, and perceived adequacy of financial aid for subgroups of the UB and CS respondents to the BSQ. The percent of students applying for aid was computed only for those students who indicated they had applied for PSE, so the percentages reported do not reflect the greater application rate for the UB group. Among those twelfth grade students applying to PSE, a much greater percentage of UB participants have applied for financial aid (slightly over half of the CS subgroup but almost 90 percent of the UB subgroup).

Those twelfth grade BSQ respondents who reported applying for financial aid were asked to report whether or not aid had been offered. As shown in Table 7.24, the proportion of UB aid applicants who reported offer of aid was not significantly different from the comparable proportion of CS aid applicants. It should be noted that indeterminate response rates (representing primarily item nonresponse) for this variable (item 45B of the BSQ) were quite high but not differential between the UB and CS subgroups. If one assumes that the distribution of the indeterminate responses among the two response categories would be the same regardless of UB membership status, then the finding of no difference would be maintained. Without such an assumption, however, differential distribution of the nonrespondents could produce results favoring either the UB or CS aid applicants. It should be pointed out that these results are time-point dependent, since data collection was in spring 1975. It is possible that substantial numbers of either or both groups were subsequently offered aid.

Those twelfth graders reporting offer of aid in response to item 45B of the BSQ were asked to evaluate the adequacy of the aid which had been offered. Among this subset of BSQ respondents, significantly smaller percentages of UB participants reported offer of inadequate aid than did nonparticipants, as shown in Table 7.24. Indeterminate response rate, while not different for the UB and CS subgroups, was again quite high, thus attenuating these results.

Table 7.24

APPLICATION FOR, OFFER OF, AND ADEQUACY OF FINANCIAL AID FOR POSTSECONDARY EDUCATION BY UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

	Group		Standard Error of Difference
	UB	CS	
Application for Aid:[a]			
Has not applied	11.4%	46.8%	* 5.3%
Has applied	87.7%	53.2%	* 5.4%
Indeterminate[b]	0.8%	0.0%	[c]
N[d]	738	228	
Offer of Aid:[e]			
Has not been offered	16.8%	19.3%	7.1%
Has been offered	42.3%	43.2%	[c]
Indeterminate[b]	40.9%	37.6%	9.0%
N[d]	650	111	
Adequacy of Aid Offered:[f]			
Not adequate	15.8%	35.7%	* 9.0%
Adequate	47.4%	33.7%	7.1%
Indeterminate[b]	36.9%	30.6%	10.4%
N[d]	291	67	

NOTE: Reported values were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of twelfth graders eligible for BSQ administration. An asterisk (*) is used to indicate a statistically significant (P < .05) difference.

[a] Computed from responses to item 45 of BSQ for that subset of individuals stating application to one or more PSE institutions.

[b] Indeterminate response represents item nonresponse, multiple response, and inconsistent response.

[c] Standard errors were not computed for absolute differences less than 1 percent.

[d] Unweighted cell sizes.

[e] Computed from responses to item 45B and 48 of BSQ for that subset of individuals stating application for financial aid.

[f] Computed from responses to item 49 of BSQ for that subset of individuals stating offer of financial aid.

This same subgroup of BSQ respondents (twelfth graders reporting offer of financial aid) were asked to report the dollar amounts of aid they had been offered from that institution which they felt they would most likely attend. The total aid package was to be reported separately for three categories of aid (grants, loans, and work study). Table 7.25 reports the average dollar amount reported for each of the categories by the UB and CS subgroups and also indicates indeterminate response rates.[29] From Table 7.25, it can be seen that the subgroup differences in offered aid packages approach statistical significance only in the area of grants, for which UB participants report an average offer of over $500.00 more aid. Relatively high, though nondifferential, indeterminate response rates again cloud the issue.

The results presented in this subsection are attenuated, for the most part, by high rates of indeterminate response. Moreover, the results reported have been obtained on a rapidly shrinking data base, so that some reported values are based on fewer than 50 cases. The increase in standard errors associated with the statistics does account for the smaller number of cases, but interpretation of observed differences between UB and CS become more tenuous due to the fact that the equivalency between the total UB and CS groups, obtained by balancing, deteriorates as one considers smaller and smaller subsets of the data.

Even in light of the limitations imposed on these analyses, the pattern of results presented in this subsection is consistent with the expectations of one familiar with the program. The results indicate that proportionately more UB applicants to PSE apply for financial aid than do comparable nonparticipants and that while UB aid applicants do not receive offers of aid in greater relative numbers, they do receive offers of more adequate aid. The greater adequacy of aid seems to come from offers of larger grants.

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[29] For these data, it was again the case that the large portion of indeterminate response represents item nonresponse, although a small percentage represented out-of-range responses (e.g., a reported offer of a grant for $50,000.000). If a determinate dollar amount was reported for any of the three aid categories, an individual was assumed to have responded to this item, even though the other responses were not given. In such cases, a lack of response to some other aid category was assumed to represent $0.00.

Table 7.25

AMOUNT OF FINANCIAL AID FOR POSTSECONDARY EDUCATION OFFERED FROM SELECTED SOURCES TO UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Source		Group		Standard Error of Difference
		UB	CS	
Grants	Indeterminate[a]	21.1%	18.3%	7.8%
	Mean[b]	$1134.05	$ 621.52	$263.40
	Standard Deviation[b]	$1562.48	$ 804.81	
Loans	Indeterminate[a]	20.1	26.8	8.4%
	Mean[b]	$ 370.00	$ 424.53	$140.50
	Standard Deviation[b]	$ 549.01	$ 658.58	
Work Study	Indeterminate[a]	22.5%	18.3%	7.8%
	Mean[b]	$ 181.46	$ 76.81	$ 58.10
	Standard Deviation[b]	$ 308.51	$ 294.54	
Cell Size		291	67	

NOTE: Reported values were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of twelfth grade students eligible for BSQ administration and stating offer of financial aid. Data presented in this table were obtained from responses to item 50 of the BSQ. None of the differences reported in this table are statistically significant (P < .05).

[a] Percent of indeterminate responses, including complete item nonresponse, multiple and out-of-range response, and inconsistent response.

[b] Computed for determinate responses only.

V. OTHER STUDENT OUTCOMES

In addition to the major objectives of the UB program, the program encourages additional practices which suggest the importance of other student outcomes. Some of these outcomes were measured in this study and are the subject of this section. As in the previous section, the student outcome measures considered were obtained from and pertain to specific subgroups of the total UB and CS samples.

A. Further Educational Outcomes for HS Dropouts

Although not a major goal, the UB program encourages attempts to motivate HS dropouts to continue their education. This may be affected by return to HS or through other channels such as High School Equivalency Education Programs (HSEEP). The short span of data collection efforts coupled with the sample definition allowed insufficient opportunity to build dropout return into the general model of HS educational continuance. Moreover, the student questionnaire (D/TQ) designed to elicit information regarding both UB and CS group HS dropouts was returned at such low rates as to render almost useless any analyses of the scanty data collected.

Some information was available for HS dropouts, however, regarding HSEEP entry and subsequent completion. These data are presented in Table 7.26. Larger proportions of UB dropouts than CS dropouts had entered some HSEEP program, and proportionately more of the UB dropouts had received an equivalency diploma by fall 1974. The differences between the UB and CS groups were not, however, statistically significant.

B. Types of PSE Entered

Although the stated goal of the program regarding PSE entry does not suggest any particular type of PSE, program philosophy (which was reflected in the site visit reports and the physical location of most projects) emphasize the importance of applying to and enrolling in 4-year colleges or universities. This subsection addresses that emphasis.

Table 7.27 summarizes the responses of UB and CS group members to an item of the BSQ which requested information concerning the types of PSE

Table 7.26

PARTICIPATION OF UPWARD BOUND AND COMPARISON GROUP HIGH SCHOOL DROPOUTS IN HIGH SCHOOL EQUIVALENCY EDUCATION PROGRAMS (HSEEP)

Participation Status in HSEEP[a]	Group		Standard Error of Difference
	UB	CS	
Entered some form of HSEEP since leaving high school	50.1%	37.7%	7.5%
Received HS equivalency diploma	32.6%	26.9%	8.4%
Number of cases (unweighted)	261	202	

NOTE: Reported percentages were computed using weighted data, after balancing within and over grade level and correcting for fall 1974 subsampling, for that subset of group members classified as high school dropouts. None of the differences reported in this table are statistically significant.

[a] For purposes of these analyses, indeterminate responses are assumed not to have participated in HS equivalency programs.

Table 7.27

PERCENTAGES OF UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS APPLYING TO SPECIFIC TYPES OF PSE INSTITUTIONS

Institution Type[a]	Group		Standard Error of Difference
	UB	CS	
Public Vocational/Technical/ Business School	28.2%	47.2%	* 6.7%
Private Vocational/Technical/ Business School	8.5%	8.9%	b/
Public 2-Year College	24.9%	27.6%	4.0%
Private 2-Year College	7.8%	7.7%	b/
Public 4-Year College	72.8%	54.9%	* 4.9%
Private 4-Year College	37.7%	16.6%	* 5.0%
Number of Cases (unweighted)	779	237	

NOTE: Reported values were computed using weighted data, after balancing and adjusting for instrument nonresponse, for that subset of twelfth graders eligible for BSQ administration and stating application to one or more PSE institutions. Data presented in this table were obtained from responses to item 44 of the BSQ. For purposes of these computations, indeterminate responses (accounting for 7 cases and 2 cases for UB and CS respectively and for 1 percent and 0.2 percent of weighted totals within the respective groups) were considered as not having applied to any of the categories of PSE. An asterisk (*) is used to indicate a statistically significant ($P < .05$) difference.

a/ Application to one type of institution does not preclude application to another type so that percentages are not constrained to sum to 100.

b/ Standard errors were not computed for absolute differences less than 1 percent.

institutions to which students had made application for admission. The percentages reported were computed only for that subset of twelfth grade BSQ respondents who had indicated application to one or more PSE institutions. As seen in the table, a significantly greater proportion of UB participants applied to 4-year colleges than did their CS cohorts. Conversely, a significantly smaller proportion of UB students had applied to public vocational, technical, and business schools.

Table 7.28 indicates the type of PSE institutions in which UB and CS group members actually enrolled. The percentages reported in Table 7.28 are based on the subset of UB and CS group members who indicated that they had attended some form of PSE during or prior to fall 1974. A substantially and significantly greater proportion of the UB subgroup had enrolled in 4-year colleges or universities, while a significantly smaller proportion of the UB subgroup had enrolled in 2-year colleges and certain types of other training schools (i.e., vocational, trade, business, etc.). Thus, in both application and enrollment, the UB participants reflect the emphasis on placement in 4-year colleges or universities.

VI. SUMMARY

The analyses presented in this chapter have been directed toward comparative student outcomes for UB participants and a statistically balanced CS group. The results are quite consistent in support of a major central theme: namely, for most outcomes relating to PSE, the UB group differs substantially from the CS group, but for other outcomes the groups do not differ. With few exceptions, this theme is pervasive, even for results that may be attenuated due to excessive or differential proportions of indeterminate data.

UB participants show greater motivation for PSE entry and for occupations requiring higher levels of education. They take more preliminary actions in preparation for PSE; they apply to and enter PSE institutions with greater relative frequency; they apply for financial aid in greater relative numbers; and the aid packages which they are offered are more adequate. Although the PSE entry rate is greater for UB participants, this

Table 7.28

TYPES OF POSTSECONDARY EDUCATION INSTITUTIONS ENTERED BY UPWARD BOUND PARTICIPANTS AND COMPARISON STUDENTS

Type of PSE Institution	Percentage Attending[a]		Standard Error of Difference
	UB	CS	
Vocational, trade, business, or other career training school not requiring a high school diploma[b]	3.3%	8.0%	2.8%
Vocational, trade, business, or other career training school requiring a high school diploma[b]	4.8%	16.3%	* 3.9%
Junior college or community college (2-year)	17.2%	31.3%	* 5.8%
Four-year college or university	75.7%	45.1%	* 5.2%
Number of Cases (unweighted)	832	252	

NOTE: Reported values were computed using weighted data, after balancing and correcting for fall 1974 subsampling on the subset of students classified as attending or having attended some PSE institution in fall 1974. An asterisk (*) is used to indicate a statistical significant ($P < .05$) difference.

[a] For purposes of these computations, indeterminate responses (accounting for eight cases in the UB group and one case in the CS group--1 percent and 0.6 percent of the unweighted within group totals, respectively) were considered as not having entered. As a result of this data treatment and the fact that an individual may have attended more than one of the specified types of PSE institutions (or some other type of institution), percentages are not constrained to add to 100 percent over PSE type.

[b] Percent attending vocational/technical schools is closely approximated by adding percents for the two subclassifications presented, since overlap (attendance at both types of institutions) occurred only once in the UB group and once in the CS group.

may be due more to the higher application rate, since acceptance rates among those who apply are no greater for the UB group. Further, although the aid packages offered to UB participants are seen as more adequate, there is no evidence that UB participants who apply for financial aid are offered aid at any higher rate than nonparticipant aid applicants.

The type of PSE institution to which UB participants apply (73 percent), and enter (76 percent), in greatest numbers is the 4-year institution. Application to and entry into this type of institution is almost double the rate of the CS group. Given the typically greater selectivity and cost of this type of institution, the higher PSE entry rates are more impressive but the larger financial aid packages are less impressive. The results are quite compatible with what one might expect from a UB project situated at a four-year college, emphasizing the importance of PSE entry, providing paid visits to other colleges, providing counseling and other assistance in applying for admission and financial aid, and having solid contacts with admission and financial aid officers at several PSE institutions.

Given equalization (by design and statistical adjustment) of the group on important preprocess variables, the small number of observed statistically significant differences between the groups on uncontrolled preprocess and extraprocess variables, the virtual lack of practically significant differences on those same variables, and no observed differential response bias on the part of the two groups, there seem to be only two plausible explanations for differences in PSE outcomes of the magnitude observed in this chapter. Either the program is facilitating PSE outcomes for participants, or students are selected for program participation, explicitly or implicitly, on the basis of some characteristic that is highly related to PSE outcomes. One such characteristic may be high motivation for educational continuance beyond high school. It was observed that UB participants plan and expect to attend PSE in greater proportions and for longer periods than the CS group. This greater motivation for education continuance after high school should be directly related to the higher incidence of PSE entry in the UB group. The question remains, however, as to whether this motivation was affected by the UB program. There is simply not enough available information from this study to definitively determine whether the UB program was instrumental in raising participants' motivation to attend PSE or whether selection into the program is based to some extent on already extant motivation (although site visit observations and interviews did indicate that some projects recruited students on the basis of existing motivation for PSE enrollment).

The data do support an hypothesis that the UB program is facilitating actions taken in preparation for PSE entry, including application. Differences between the two groups in motivation to attend PSE were reduced to some extent by restricing the analysis to the subset of students planning PSE entry. Because of this restriction, quantitative motivational differences cannot provide a plausible alternative explanation of this finding, although qualitative differences in degree of desire to attend PSE may still exist. While preparatory actions and application rates are higher in the UB group, actual acceptance into PSE among those students who apply is not significantly greater for UB participants. The major function of the UB program in this area, therefore, appears to be that of aid in the initiation of actions leading to admission rather than aid in gaining admission once application has been made. It should be pointed out again, however, that the UB program is working with large proportions of "high risk" students. The higher application rate among UB participants would, therefore, likely include among the group of UB applicants greater proportions of these high risk students than among the CS applicants. If this is the case, then even a similar acceptance rate for UB participants would suggest that the UB program is facilitating PSE admission among those who apply.

There is, however, little evidence to indicate that the UB program is instrumental in increasing HS retention among participants. For one group of participants (tenth graders), participation in the program does appear to be related to reduced full-year dropout rates; however, this does not imply that higher retention rates among tenth graders would be realized by all projects were they to enroll tenth graders. Recalling that few UB projects enrolled tenth graders in substantial numbers, it follows that a large proportion of the tenth grade UB participants come from a small proportion of the UB projects. Success with HS continuance of tenth graders may be due, therefore, to practices unique to those projects recruiting large numbers of tenth grade (or younger) students.

There is some indication that the UB program may be facilitating potential success in PSE. Although definition and measurement problems do not allow examination of skills and motivation that are necessary for PSE success, some measures of academic skills and some components of motivation were examined. In terms of increased HS GPA, proportion of academic courses taken, or proportion of advanced courses taken, there is no indication of any relationships to UB participation for the gain measures employed in this study. There is, however, evidence that UB participants receive larger and more adequate financial aid packages, which should facilitate their success in PSE. Further, higher levels of desires and expections for entry into, and further continuance in, PSE are observed among the UB participants, although this cannot be directly attributed to participation in the program. In some cases, these findings were attenuated by a large percentage of indeterminate data and/or a small number of cases. Further, the particular measures used for this evaluation may be questioned. Thus a true evaluation of the third major objective cannot be made from the data of the current study. The overall thrust of the results would, however, indicate that the UB program is providing services that facilitate success in PSE.

Chapter 8

Student Outcomes as Related to Project Characteristics

I. GENERAL

In the previous chapter, student outcomes for UB participants were examined at a national program level. The natural question arises (quite independent of the previous comparisons of the UB and CS groups) as to whether certain project characteristics are related to differential UB participant outcomes. That is, are certain structural and/or functional characteristics of projects associated with "more desirable" or "less desirable" student outcomes? An examination of this basic question is the focus of this chapter.

Obviously, UB projects can be classified according to certain input and process variables; in Chapter 5, characteristics of the UB projects were examined, and a considerable extent of variation among projects was indicated along several structural and functional dimensions. There are projects that select primarily black participants and others that direct their efforts toward Mexican-Americans or Native Americans. Similarly, there are projects operating within the environment of a 2-year PSE institution and others operating at 4-year institutions. Functional process differences also exist, with some projects more heavily emphasizing remedial academic instruction and others with a greater emphasis on personal growth. Of greater interest, however, is a classification (or set of classifications) of projects in terms of output (for purposes of this chapter, output will be defined in terms of the student outcomes examined in Chapter 7). Given that UB participants enter PSE at much higher rates than the CS group, are some projects characterized by very high PSE entry rates and others by very low rates, or do all projects maintain a more or less equivalent rate? This question was not addressed in Chapter 7; and if, in fact, such variation exists among projects, then an examination of the nature of the variation as a function of other project characteristics is possible.

The question addressed in this chapter is a sensitive one, involving implications of differential effectiveness of UB projects. There is every reason to expect that projects differ in terms of their effectiveness as measured by student outcomes; only the extent of the variability is in question. It is also quite logical to assume that there are reasons why some projects are more effective than others. It should be pointed out, however, that the variability in effectiveness is relative variation. The absolute magnitude of the variation, or deviations, of UB projects from some absolute base is not the major focus of these analyses. Rather, any existing variation will be examined and attempts will be made to identify its sources.

The analyses used to address these questions were conducted in the spirit of relational analysis. Significant contributions of an "independent," "predictor," or "discriminatory" variable in a statistical model in no way suggests that changes in the variable in question causes the dependent variable to change. Findings from such exploratory analyses should not be used indiscriminately to alter programs but rather should be further examined in planned variation studies that follow the logic of experimental or quasi-experimental design (from which causation may be logically inferred). The analyses should be considered exploratory for two major reasons: first, the program characteristic or function variables as well as the student outcomes are based on questionnaire data that are subject to reporting error and biases; second, not enough is known about the UB program to test well-defined models of the UB process. It should also be noted that the major goal of this study was to examine the overall impact of UB and not to evaluate specific Upward Bound strategies. In order to conduct a comprehensive evaluation of the impact of program factors within UB, measures of UB program functions and processes should be based upon comprehensive and detailed measures and observations of program functioning by trained unbiased observers. The measures in the present study are not as comprehensive, detailed, or unbiased as those measures typically used in program evaluation. However, some measures are available from project level questionnaires which attempt to measure at a gross level some UB processes that might be relevant to the successful operation.

There are several alternative ways of seeking answers to these questions, and the present chapter presents the results of one such approach. Given the joint constraints of data, time, and funds, the plan adopted is considered to be near optimal. Since the approach differs both conceptually and methodologically from previous analysis, considerable preliminary explanation seems warranted. For that reason this introductory section will constitute a rather lengthy departure from the presentation of analysis results. It is felt, however, that a basic understanding of the concepts guiding and contributing to these analyses is extremely important to the understanding and interpretation of specific results.

A. Basic Approach to Analysis

Several interrelated decisions (involving considerations of data quality and availability, time and budget constraints, statistical appropriateness, ease of presenting results, and generalizability of results) guided the choice of an approach to analysis of project variation. The final choice was between two basically different approaches, reflecting two different philosophies of data analysis. On the one hand, the data could be used to calculate national parameter estimates with all analyses weighted and adjusted. This would require computation of appropriate standard errors for the estimates which would compensate for the differential selection probabilities and other effects of the complex sample design. The other approach is that of considering only the 54 projects sampled and making no attempt to generalize beyond these 54 projects. Concomitant with these two approaches to data analysis are two differing points of view regarding the thrust of the results. In providing national estimates, the analyses would reflect the classical estimation and hypotheses-testing philosophy--identifying project characteristics that are significantly related to student outcome measures on a national level. The other approach reflects an hypothesis-generating philosophy--examining the sample data for patterns and relationships and using obtained results to generate hypotheses that would be subject to test in subsequent studies.

The procedure chosen was primarily an hypothesis-generating approach. There are several reasons for relying so heavily on the hypothesis-generating philosophy. First, the study design was more appropriate for testing hypotheses concerning the major analysis questions of national program evaluation than for testing for differential program effectiveness. Due to this emphasis, the sampling plan was developed to produce more precise estimates of student parameters than of project parameters. Second, the depth of analysis that could be performed for a national perspective was considerably more limited than that which could be achieved when examining only the sample data.[1/] Third, due to the extremely large number of potential variables, and the limited number of cases (a maximum of 54 projects), the analyses progressed through a sequence of steps, with resort to *post hoc* methods and data dependent analysis techniques. For these reasons, the analyses presented in this chapter were conducted using unweighted data. The tradeoff made as a result of accepting the hypothesis-generating approach is that the results do not necessarily generalize to the population of UB projects.[2/]

B. Data Aggregation

As indicated above, the aim of this set of analyses is to explore the possibility of relationships among UB input, process, and output variables. Given the nature of UB, the program-related processes operate on UB students at the project level; hence, the unit of analysis for this chapter is the project, which provides the most meaningful and interpretable analytic base. In order to organize the data base for a project-oriented analysis, several preliminary procedures were necessary. In general, the approach was to produce a single measure at the individual project level for each attribute of input, process, and output considered. This was accomplished by project level aggregation of student data and staff data; in the latter case, aggregation within and across staff category was possible. The resulting manipulations produced a data base of 54 observations (projects)

[1/] The more powerful--and more appropriate--multivariate techniques used in this chapter can be used in the hypothesis testing approach, but with the sample design employed in this study, computation of appropriate standard errors is extremely expensive in both time and money. Without such standard errors, however, resultant estimates could be misleading even though they would be statistically unbiased.

[2/] One set of analyses, involving a multiple regression approach to the relationship between input, process, and output variables (see section III), does include an investigation of the use of sampling weights and estimates of design effects influencing the standard error of various estimates.

on a set of variables covering student preprocess measures (project input), project structure and function (project process), and student outcome measures (project output).

There were two aggregation processes--combining data provided by staff and combining data provided by students. In each case, the aim was to incorporate equivalent data elements, available from different individuals within a project, to a single aggregate value of that data element at the project level. The staff data were collected from three sources--project directors, counselors, and instructors. For each project there was one director, typically several counselors and instructors, and from 0 to 174 students. Table 8.1 presents the distribution of sample sizes and response rates, by project, for the three staff categories and students. This table indicates the maximum number of cases available for aggregation of any variable. For any given variable, however, these numbers were reduced due to elimination of variables containing indeterminate responses (item nonresponse, multiple responses, or inconsistent response).

The aggregation procedure for the staff data involved either one or two steps, depending on the variable considered. The first step was an aggregation within staff category (for those staff categories with more than one possible respondent). For any given variable, this step involved computing an average value based on the available valid responses of all counselors or all instructors from a given project.[3/] This process provides a single average item value within each staff category for each project.[4/]

[3/] Note that the directors required no aggregation since there was only one possible respondent per project. For counselors or instructors, if all responses within the staff category were indeterminate (e.g., if all counselors from a project failed to respond to some item), then the project aggregate value of the variable for that staff position was also indeterminate. If only one staff member, of those responding, had provided a determinate response for a given item, then the project aggregate item value for that staff category mirrored that single response.

[4/] As discussed in Chapter 5, an attempt was made to produce an index of variability as well as an average value for each item. Due to the fact that only one counselor responded for several projects and that there were relatively high levels of item nonresponse among both counselors and instructors, the variability index was inappropriate for many items and projects and was, therefore, not analyzed.

Table 8.1

SAMPLE SIZES AND RESPONSE RATES FOR UB PROJECTS

Project Number	Directors		Counselors		Instructors		Students	
	Responded	Sampled	Responded	Sampled	Responded	Sampled	Responded[a/]	Sampled
1	1	1	1	3	1	3	68	75
2	1	1	3	3	3	3	62	63
3	1	1	1	1	2	5	53	64
4	1	1	0	0	5	6	100	104
5	0	1	1	2	2	4	56	81
6	1	1	2	2	1	4	79	83
7	1	1	3	3	2	3	108	113
8	1	1	1	1	4	5	122	133
9	1	1	2	2	4	4	69	76
10	1	1	2	3	2	3	64	72
11	1	1	1	2	1	4	38	39
12	1	1	1	1	3	3	37	38
13	1	1	1	2	4	4	62	65
14	1	1	2	2	3	4	72	81
15	1	1	2	2	4	4	76	84
16	1	1	1	1	4	5	50	52
17	1	1	3	3	3	3	17	18
18	1	1	2	2	4	4	62	66
19	1	1	2	2	4	4	65	67
20	1	1	1	1	3	3	47	48
21	1	1	2	2	4	4	91	97
22	1	1	2	2	2	2	25	26
23	1	1	2	2	4	4	120	125
24	1	1	1	2	3	4	95	101
25	1	1	2	2	2	4	164	174
26	1	1	2	2	2	4	90	94
27	1	1	2	2	3	4	31	40
28	1	1	2	2	4	4	66	74
29	1	1	2	2	4	4	58	60
30	1	1	2	2	4	4	65	69
31	1	1	1	1	4	5	70	75
32	1	1	3	4	2	2	47	47
33	1	1	1	2	1	4	64	68
34	1	1	1	1	2	5	83	84
35	0	1	1	2	1	4	66	75
36	0	1	0	2	4	4	38	53
37	1	1	2	2	4	4	34	40
38	1	1	2	2	3	4	53	55
39	1	1	2	2	4	4	46	49
40	0	1	1	2	3	4	71	77
41	1	1	1	1	4	5	46	50
42	1	1	4	4	2	2	69	70
43	1	1	1	2	2	4	77	79
44	0	1	0	0	2	3	34	37
45	1	1	1	2	1	4	113	115
46	1	1	0	0	2	6	32	40
47	1	1	2	2	3	4	44	53
48	1	1	1	2	3	4	39	42
49	1	1	1	1	3	5	0	0
50	0	1	1	2	3	4	68	70
51	1	1	1	1	5	5	118	125
52	1	1	2	2	2	4	59	63
53	1	1	3	3	1	3	32	32
54	1	1	1	4	2	2	27	29

NOTE: Project 49 was a new project and at the time of the survey it had no students in the appropriate grades.

[a/] Returned at least one of the various student questionnaires.

The various means are based on differing numbers of cases depending upon the number of staff sampled, the number responding, and the item response rates involved for a given variable.[5/]

Given the three staff category aggregates, a second step was taken for variables common to all three staff questionnaires (see Chapter 2, subsection VII.D), involving the combination of data across the staff categories. Equal weighting of the responses from each staff category (regardless of the differing number of individuals in the separate categories) insured that these over-staff aggregates would reflect each staff position equally. Hence, a simple average was computed of the available within-staff aggregates. If the aggregate value for a given staff position was indeterminate, then that staff category did not contribute to the over-staff aggregate. It can be seen that in extreme cases it was possible for the over-staff aggregate to be based on the response of only one staff member for some variables.[6/]

The aggregation of the student data involved a much simpler process. A weighted mean was computed for each project based on the valid student data for that project. Indeterminate data were ignored in these computations but weight adjustments were made, if required, to compensate for the fall 1974 subsampling.[7/] The number of cases available for computing this mean varied as a function of the size of the project and availability of determinate data.

C. Variable Selection

Several criteria were used to determine which variables were to be selected for these analyses. Variables were chosen to provide measures in three areas: (1) preprocess status of students, (2) project activities, procedures, and characteristics, and (3) student outcomes. Measures within

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[5/] Discussion of the distribution of some of these staff aggregates has been presented in Chapter 5, section III.

[6/] Those few variables, for which this extreme situation arose, were not used in subsequent analysis.

[7/] The weight adjustments performed were analogous to those described in Chapter 7 involving a distribution of the weight of a nonsampled individual to those other individuals in the same project most like him. See Appendix F for a more detailed discussion of weight adjustment.

these areas were selected on the basis of face validity, variability, stability, and extent of indeterminate data. In other words, measures were sought that reflected important attributes of the UB process (e.g., kind of instruction) or that were obvious candidates for outcome indices or for control of differences in initial selection of UB students (e.g., ninth grade GPA). Additionally, the measures were examined for within-project and between-project variability. Measures having little within project variability and high between project variability were preferred. Finally, the rate of indeterminate data was considered, and if this rate was high for a given data element, then that element was not included.

The selected preprocess measures are listed in Table 8.2 (see Chapter 7, section I). The table provides, for each variable, descriptive statistics for the distribution over projects of the availability of data for the variable as well as for the distribution of the project aggregate value of the variable. The data availability rate distributions indicate that, in general, the amount of indeterminate data on a project-by-project basis is relatively low. The worst case is for ninth grade GPA, for which determinate data were available for only 17 percent of the students at two projects. The distributions of the project aggregates show reasonable variation and symmetry.

Table 8.3 lists the student outcome measures that were selected (see Chapter 7, section I), with an indication of the variability over projects of data availability and value of the outcome measures. Since the output measures are most central to the analyses, the full distributions of projects for the seven outcome measures are also presented in Tables 8.4 through 8.6. The project-by-project data availability rates are not as high as those obtained for the preprocess measures. Specifically, for the two academic change measures the average project data availability rate is fairly low, between 47 and 56 percent. The major factor leading to these low data availability rates was lack of current year academic information in the UB files (see Chapter 7, subsection IV.A). The lack of data for the fall-to-fall HS continuance/completion rates and PSE entry rates reflects, primarily, those students who were not selected during the fall 1974 subsampling procedure. The potential effect of the sizeable amount of

Table 8.2

SUMMARY STATISTICS FOR DATA AVAILABILITY AND AGGREGATE VALUE OF PREPROCESS STUDENT MEASURES

Variable	Data Availability Rates[a/]					Values of Variable[b/]				
	Minimum	Maximum	Mean	Standard Deviation	Median	Minimum	Maximum	Mean	Standard Deviation	Median
9th Grade Academic GPA[c/]	17%	100%	83.2%	21.1%	92.7%	4.4	5.6	5.0	0.27	5.0
Proportion of 9th grade courses which were academic	23	100	87.0	16.0	93.7	0.48	0.83	0.66	0.08	0.66
Proportion of students who were male	100	100	100	0.0	100	0.19	0.98	0.44	0.13	0.45
Proportion students who were "poor"	68	98	87.2	7.6	89.9	0.36	0.96	0.73	0.14	0.76
Proportion of students who were "academic risk"	93	100	99.2	1.6	99.8	0.15	0.86	0.47	0.16	0.48
Proportion of students in 11th grade	81	100	97.0	4.0	98.4	0.14	0.60	0.39	0.11	0.38
Proportion of students in 12th grade	81	100	97.0	4.0	98.4	0.00	0.74	0.46	0.14	0.47

NOTE: One project had no students and thus all statistics reported in this table are based on 53 cases.

[a/] The project data availability rate for a variable is the proportion of students in the project for whom determinate data for that variable is available. The percent of available data within a project was determined using unweighted counts of determinate and indeterminate data.

[b/] The project aggregates of student measures were computed for available determinate responses using sampling weights and adjusting for nonresponse due to fall 1974 subsampling.

[c/] Normalized GPA value of 5.0 corresponds to the 50th percentile (see Appendix E).

Table 8.3

SUMMARY STATISTICS FOR DATA AVAILABILITY AND AGGREGATE VALUE OF STUDENT OUTCOME MEASURES

Variable	Data Availability Rates[a/]					Values of Variable[b/]				
	Minimum	Maximum	Mean	Standard Deviation	Median	Minimum	Maximum	Mean	Standard Deviation	Median
Change in GPA, 9th to current grade	3%	95%	46.9%	28.0%	48.0%	-0.49	0.83	0.01	0.23	0.02
Proportion of 12th graders entering PSE[c/]	89	89	70.0	11.6	68.6	0.08	1.00	0.63	0.20	0.66
Fall-to-fall HS continuance/ completion rate	59	86	74.9	6.4	74.9	0.49	1.00	0.90	0.09	0.92
Change in proportion of attempted academic courses	4	99	56.1	30.1	55.0	-0.22	0.22	-0.04	0.10	-0.06
Proportion of PSE entrants enrolling in vocational/ technical schools[d/]	--	--	--	--	--	0.00	0.83	0.09	0.13	0.06
Proportion of PSE entrants enrolling in 2-year colleges[d/]	--	--	--	--	--	0.00	0.69	0.16	0.16	0.13
Preparation of PSE entrants enrolling in 4-year colleges[d/]	--	--	--	--	--	0.00	1.00	0.70	0.24	0.78

NOTE: There was one project with no students and one project with no seniors, thus statistics presented involving PSE entry are based on 52 cases and all other statistics are based on 53 cases.

[a/] The project data availability rate for a variable is the proportion of students in the project for whom determinate data for that variable is available. The percent of available data within a project was determined using unweighted counts of determinate and indeterminate data.

[b/] The project aggregates of student measures were computed for available determinate responses using sampling weights and adjusting for indeterminate response.

[c/] Values for this variable were computed using as a base only the twelfth grade students.

[d/] Values for these variables were computed using a base of only the twelfth grade students who indicated PSE entry. Since the determination of PSE entry and type of PSE entered were, in most cases, from the same questionnaire item, data availability rates for the defined subset of cases are close to one and are not reported.

Table 8.4

FREQUENCY DISTRIBUTIONS OF PROJECTS ON FIVE STUDENT OUTCOME MEASURES

Proportion	Outcome Measure				
	Fall-to-Fall HS Continuance[a]	Twelfth-Graders Entering PSE[b]	PSE Entrants in Vocational/Technical[c]	PSE Entrants in 2-Year College[c]	PSE Entrants in 4-Year College[c]
.95 to 1.00	17	1			4
.90 to .94	18				2
.85 to .89	10	3			9
.80 to .84	2	7	1		10
.75 to .79	3	6			8
.70 to .74	1	4			2
.65 to .69	1	9		1	2
.60 to .64		5			2
.55 to .59		3		1	2
.50 to .54		1			2
.45 to .49	1	2		1	
.40 to .44		5		3	1
.35 to .39		1	1	1	3
.30 to .34		1	1	3	1
.25 to .29		1		2	1
.20 to .24		1	2		
.15 to .19		1	4	10	1
.10 to .14			7	11	
.05 to .09		1	14	6	
.00 to .04			22	13	2
Data Unavailable[d]	1	2	2	2	2
Total	54	54	54	54	54

NOTE: All of the outcome measures reported in this table are based on within-project proportions of students.

[a] Based on all project participants for whom data were available.

[b] Based on all twelfth grade project participants for whom data were available.

[c] Based on all project participants entering PSE for whom data were available.

[d] There was one project with no students and one project with no seniors, which account for unavailable data.

Table 8.5

FREQUENCY DISTRIBUTION OF PROJECTS ON AVERAGE CHANGE IN STUDENT ACADEMIC GRADE POINT AVERAGE

Value of Outcome Measure	-.45 or Less	-.44 to -.35	-.34 to -.25	-.24 to -.15	-.14 to -.05	-.04 to .04	.05 to .14	.15 to .24	.25 to .34	.35 to .44	.45 to More
Number of Projects	1	1	5	7	3	14	11	5	4	1	1

NOTE: This outcome measure was based on within-project averages of students' change in academic grade point average. Since one project had no students, the total number of projects with values for this outcome variable is 53.

Table 8.6

FREQUENCY DISTRIBUTION OF PROJECTS ON AVERAGE CHANGE IN STUDENT ACADEMIC COURSE LOAD

Value of Outcome Measure	-.24 to -.20	-.19 to -.15	-.14 to -.10	-.09 to -.05	-.04 to 0	0 to .04	.05 to .09	.10 to .14	.15 to .19	.20 to .24
Number of Projects	2	4	11	13	5	12	2	2	0	2

NOTE: This outcome measure was based on within-project averages of students' change in proportion of courses taken that were academic. Since one project had no students, the total number of projects with values for this outcome variable is 53.

indeterminate data for these variables was further investigated. It was found that the percent responding in a given project was not systematically related to the computed aggregate value of the process and preprocess variables for any of the output measures. Even though no relationship was found, it should still be kept in mind that for some projects the project aggregate is based on less than half the students.[8/] Any systematic factors causing nonresponse within a project will be reflected as bias in the analyses.

Independent of response rates, several points may be observed concerning the distributions of the output variables. First, there is meaningful variation among projects on most of these measures; for example, the range in PSE entry rates is from .08 to 1.00. Only the fall-to-fall continuance/completion rate and vocational/technical school entry rate show marginal variability. While the absolute range for these variables is fairly wide, the great bulk of the projects fall in a very narrow band; the extreme base rates for these variables tends to limit variation. The distributions of the two academic change scores have means near zero, but there is a reasonable distribution of projects over the entire range of scores. In summary, these outcome measures seem to reflect relatively large differences in output between projects and show promise as a means of sorting projects.

Another set of variables to be considered are those dealing with the UB process. Basically, there are two categories of variables that pertain to this set of variables--staff characteristics and program characteristics. The set of staff characteristics was limited to a few areas that provide similar measures over the three staff categories (e.g., staff experience). The measures of program characteristics were limited to those measures for which data were common to the responses from staff members in all three staff categories (see Chapter 2, subsection VII.D).

[8/] The student aggregates within a project were computed using weighted data, and adjustments were made for nonresponse due to the fall 1974 subsampling. But the tacit assumption exists that nonrespondents would have responded in a fashion similar to the respondents most like them.

Beyond the desire to collect input from all staff categories, the problem of missing data constrained variable selection to some extent. The relational analyses planned for this chapter are quite sensitive to missing data. For some of the planned analyses, projects with missing data on only one of a large set of variables would have been removed from the analysis. In light of the relatively small number of initial analysis units (54), it was considered better analytic practice to instead eliminate the variables with large amounts of missing data. This decision greatly restricted the selection of variables related to only one staff category, especially among project directors, where there was only one possible respondent per project.

The selected process measures are listed in Table 8.7. They deal with (1) staff characteristics--training, experience, attitudes, and interpersonal relationships, and (2) project procedures--activities, functions, and types of instruction. Given the constraints on variable selection listed above, this set of variables still provides an adequate summary of the basic activities and staff attitudes that exist within a project. If differences exist in basic style of operation between projects, then this set of measures should reflect those differences.

A final set of project characteristics available for the analyses presented in this chapter are the indices of project groupings that were established in defining the sampling frame for the study. At the time of sample frame construction, certain project characteristics were suspected, _a priori_, to be related to student outcomes. Information was therefore collected on several specific project dimensions prior to drawing the project sample. Six of these dimensions were selected to form _a priori_ clusters of projects. Table 8.8 lists these measures and the project categories defined by each measure; Appendix B provides more detail about the collection of these data and derivation of the categories. Each dimension defines from two to five clusters of projects. It should be noted that these project classifications do reflect structural and functional project attributes in a general sense, but some reflect more the characteristics of the students served by the project.

One final project attribute used in the analyses reported in this chapter was project size. This attribute was determined directly by the number of eligible students in the project as of fall 1973 (given in Table 8.1).

Table 8.7

PROJECT LEVEL PROCESS MEASURES

Variable	Questionnaire Source[a/]	Level of Aggregation	Number of Items
Instructional practices	PIQ 28	Over instructors	11
UB functions	PIQ 25, PDQ 17, PCQ 20	First within each staff category, then over categories	14
Instructor experience	PIQ 11, 13, 14A, 15	Over instructors	4
Counselor experience	PCQ 11A, 12, 13, 14, 15A, 16	Over counselors	6
Staff ratings of students	PDQ 34, PIQ 35, PCQ 34	First within each staff category, then over categories	12
Relations of staff and students	PDQ 28, PIQ 38, PCQ 32	First within each staff category, then over categories	5
School cooperation	PIQ 39A, PCQ 33	First within each staff category, then over categories	5
Philosophy	PDQ 23, PIQ 29 PCQ 30	First within each staff category, then over categories	14

[a/] See Appendix D for the specific questionnaire item.

Table 8.8

A PRIORI PROJECT GROUPINGS

Project Classification Dimension	Categories	Number of Projects in Each Category
Type of Sponsor	2-Year College	6
	4-Year College	46
	Other	2
Location of Target Population	City	6
	Area within City	8
	Rural	8
	City and Rural	28
	Other	4
Racial Composition of Project[a]	Predominantly Black (80%+)	15
	Black and White	13
	Indian	8
	Spanish-speaking	15
	Other	2
Length of Project Operation	Less than 2 Years	10
	2 Years	8
	3 or More Years	34
	Indeterminate	2
Project Emphasis	Academic Skill	26
	Personal Development	6
	Combination	19
	Other	3
Extent of Coordination with Other Programs for the Disadvantaged	No Coordination	24
	Some Coordination	30

[a] Categorization of projects is determined as follows: predominantly black means 90 percent or more black; black and white means both black and white membership greater than 10 percent, but no other racial group greater than 10 percent; Indian means greater than 10 percent Native American; Spanish-speaking means Puerto Rican or Mexican American greater than 10 percent but Indian less than 10 percent; other includes all other.

D. Description of Statistical Methods

The approach to analysis taken in this chapter differs considerably from that of previous chapters, both conceptually and methodologically. The purpose of this subsection is to provide the reader with a basic feel for the nature of the various statistical techniques used. Emphasis in this chapter shifts from that of examining each of several variables or questionnaire items separately (univariate analysis) to that of considering a set of variables simultaneously (multivariate analysis). The description of the multivariate methods will be extremely general, and will not provide a substantive knowledge of the statistical details of these methods (which could only be gained from a more extensive discussion). The techniques are, however, discussed in greater detail in Appendix G and supplemental references are provided. Such general descriptions of complex statistical techniques, without introduction of appropriate mathematical conventions, are inherently subject to some misinterpretation. For this reason, the reader is encouraged to consult Appendix G, or some other more complete presentation of the techniques.[9/]

All of the techniques described in this subsection may be used either descriptively or inferentially (i.e., either describing the relationships existing for a given set of data or inferring some relationship that may exist in the population from which the set of data has been drawn). Due to the exploratory nature of the questions addressed in this chapter, a descriptive approach is dictated (as previously discussed in subsection I.A).

1. Factor Analysis[10/]

Factor analysis is a method for analyzing data whereby the underlying structure or pattern of relationships among multivariate

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[9/] For a more detailed, but still basic, discussion of the statistical techniques used in this chapter, refer to: Nunnally, J. Psychometric Theory. New York: McGraw-Hill, 1967.

[10/] For a nontechnical introduction to factor analyses, see: Rummel, R. J., Applied Factor Analysis. Evanston, Illinois: Northwestern University Press, 1970. For a description of the actual computational procedures used, see: Nie, N. H., et al. Statistical Package for the Social Sciences (2nd edition). New York: McGraw-Hill, 1970.

data may be examined and assessed. Given the observed patterns of variation and covariation (correlation) among a set of variables, factor-analytic techniques allow for the identification of underlying factors, components, or dimensions which may explain the observed relationships. The basic characteristic of such techniques is that of data reduction, in that one seeks a relatively small set of common factors which adequately explain a substantial proportion of the variation and covariation of a much larger set of empirical measures. While factor analysis is historically associated with exploratory analyses (i.e., the identification of theoretical constructs underlying manifest behavioral measures), other applications of the method have developed.[11/] Within the framework of this study, factor-analytic techniques have been used as a measurement tool, to construct, from existing data, a few meaningful composite indices for use in subsequent analysis. Thus, many responses have been summarized by a few indices with, hopefully, little loss in meaning or explanatory power.

2. Cluster Analysis[12/]

Clustering may be generally defined as a technique whereby objects (or events) are categorized into groups (clusters) on the basis of their empirical attributes. (Although the attributes or variables may also be clustered, the present discussion will not address such an application of clustering.) While there are many functions of the attributes which could be used in clustering, a commonly used criterion is that of similarity. That is, given a set of objects and a set of measures defined on the attributes of those objects, clustering techniques allow one to establish two or more

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[11/] Factor analysis was initially employed in the area of identifying the underlying "mental" factors which might explain variability of and covariability among the scores of diverse ability and aptitude measures.

[12/] For an introductory discussion of clustering techniques, refer to: Overall, J. E. and Klett, C. J. Applied Multivariate Analysis. New York: McGraw-Hill, 1970. For a description of the actual computation procedures used, see: Levinsohn, J. R. and Funk, S. G. Cluster: A Hierarchical Clustering Program for Large Data Sets. L. L. Thurstone Psychometric Laboratory, Research Memorandum No. 40. Chapel Hill, N.C.: University of North Carolina, February 1974.

empirically homogenous groups (i.e., the similarity of members within a group is greater than that of the group members to members of some other group).

The clustering problem is one of two major types of problems addressed by profile analysis techniques. Specifically, the problem in clustering is that of establishing groups of objects that are similar, when no previous classification as to group membership is available (i.e., the empirical determination of similar groups on the basis of available measures). Other major types of profile analysis address the question of differentiation among known groups on the basis of available measures. One such technique, discriminant analysis, is discussed in the following subsection.

3. Discriminant Analysis[13]

Discriminant analysis is a technique which allows maximum distinguishability (discrimination) between two or more predefined groups on the basis of a predetermined set of measures. The technique produces the weights necessary for those linear combinations of the measures which define the dimensions[14] on which the groups are as statistically distinct as possible. While none of the original variables, when taken singly, may differentiate greatly between the groups, it is often possible to determine one or more linear combinations of these variables which easily allow one to tell the groups apart. The defined linear combinations resulting from the analysis are called discriminant functions.

Once the discriminant functions have been determined, statistical tests are available to determine the relative degree of group differentiation that has been obtained. Moreover, it is possible, on the basis of the discriminant function (and other information such as the prior probabilities of group membership) to classify a new object

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[13] For a more technical discussion of Discriminant analysis, refer to: Overall, J. E. and Klett, C. J. Applied Multivariate Analysis. New York: McGraw-Hill, 1970.

[14] The maximum number of allowable dimensions equals one less than the number of groups, or the number of variables, whichever is less.

(which did not contribute to the original analysis or for which group membership is unknown) as more likely belonging to one or another of the groups. This classification function may also be used to verify the success of the discriminant analysis by classifying the original objects as to group membership on the basis of those functions and observing the degree of correct and incorrect classification in light of the known group membership.

4. Multiple Regression[15]

Multiple regression is a very general statistical technique whereby the relationship of one variable (measure) to a set of other variables may be assessed. Generally, the technique allows the determination of that linear combination of the variables in the predictor set which best predicts (shows the greatest zero-order correlation with) the single criterion variable.

The important conceptual difference between multiple regression and simple bivariate regression is that of partial correlation. Specifically, in determining the best linear combination of the predictor variables, it is important to go beyond the simple zero-order relationship of each predictor to the criterion. This involves evaluation of relationships to the residual portion of the criterion variable which remains when the prediction of all other variables in the predictor set has been removed (partialed).

In addition to providing the necessary weights for producing the most predictive linear combination of the predictor variables, the analysis yields a statistic, R^2 (the square of the multiple correlation coefficient), which is a measure of the proportion of variance in the criterion variable which may be explained by the predictor variables considered simultaneously.

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[15] For an introduction to multiple regression, refer to: Draper, N. R. and Smith, H. Applied Regression Analysis. New York, Wiley, 1966.

5. Stepwise Approaches[16]

Because of the large number of variables involved in the analyses reported in this chapter (see subsection I.C) and the relatively small number of projects (maximum of 54), a full-model analysis could not be performed for either the multiple regression analyses or the discriminant analyses. A common tactic in cases such as this is the use of a stepwise approach to the solution. Stepwise approaches are sequential analysis techniques whereby at each step of the process one additional variable is added to the model on the basis of some established criterion.[17] This addition of variables into the model continues, step-by-step, until none of the remaining variables (i.e., those not already in the prediction equation or discriminant function) meet the criterion for inclusion in the model.[18]

While stepwise techniques typically provide testable regression or discriminant function models composed of considerably fewer than the total number of available variables, they may sometimes be misleading. Such techniques tend to make the most of chance variation among certain variables, and thus do not replicate easily across different samples unless truly strong relationships exist among the variables. This tendency to produce spurious results and oversimplified or nonrational models should be fully recognized by the reader when the results from stepwise approaches are examined.

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[16] For a description of stepwise discriminant analysis, including computational procedures used, see: Dixon, W. J. (Ed.) BMDP: Biomedical Computer Programs. Berkeley, California: University of California Press, 1975. For an analogous description of stepwise multiple regression, see: Service, J. A User's Guide to the Statistical Analysis System. Raleigh, N.C.: North Carolina State University, 1972.

[17] For example, in stepwise multiple regression, the variable which explains the greatest proportion of the previously unexplained variation in the criterion variable would be a candidate for inclusion in the regression model.

[18] For example, in stepwise multiple regression one may wish to stop the process if none of the remaining candidates for inclusion into the regression model can account for more than X percent of the previously unexplained variability of the criterion variable.

E. Data Reduction

This subsection discusses a set of procedures directed toward reducing the large pool of project process measures (71) to a smaller number of project composites which maintain meaningful information about the process attributes of the UB projects. The reason for attempting data reduction at this point in the analysis process concerns the large number of measures due to the multiple responses called for in the questionnaire items selected. Such a large number of available process measures creates two problems. First, analysis with such a large set of measures is very cumbersome. Second, since analysis at the project level provides a maximum of 54 cases, the number of variables must be kept small to avoid trivial solutions. Beyond these analytic problems there are many benefits that derive from combining single questionnaire items into composite scale scores. In general, the distributions of composite scale values are more tractable and stable, and the interpretation of a reduced set of variables is usually simpler and less confusing.

The process variables introduced in subsection I.C provide many candidates for either a priori scale construction or empirical scale construction through factor analysis. The most obvious candidates are questionnaire items with more than one subitem, or groups of separate questionnaire items that measure attributes of the same UB function. Table 8.9 lists the resulting composites derived from the data reduction procedures as applied to the variables listed in Table 8.7. In general, the procedure that was followed involved the computation of a principal component factor solution for each set of variables. Empirical solutions were used if they reproduced 55 percent or more of the variation in the set of variables.[19] In cases where no satisfactory empirical solution was obtained, a priori scale composites were used. The a priori composites were derived by grouping similar subitems together according to item content and the criteria developed in the instrument specifications. In all cases, the final scale composites were simple sums of subitems using either positive or negative unit weights.

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[19] Appendix G describes the factor analysis procedures that were used and presents the resulting solutions in more detail.

Table 8.9

PROJECT LEVEL PROCESS COMPOSITES

Variable Class[a]	Resulting Number of Composites	Type of Solution	Percent Variance[b]
Instructional practices	3	Empirical	55.5
UB functions[c]	14	(No Reduction)	—
Instructor experience	2	Empirical	70.8
Counselor experience	2	Empirical	61.6
Staff ratings of students	3	Empirical	62.2
Student/staff relations	3	Empirical	76.0
School cooperation	2	A priori	—
Philosophy	3	A priori	—

[a] These classes correspond to those given in Table 8.4.

[b] Value given is the percent of variance in the original variables accounted for by the principle component factor solution.

[c] For this variable, no a priori scaling was attempted and the empirical solution did not provide interpretable composites. Hence, all 14 subitems were maintained.

For all empirical solutions, the weights were applied to the standardized[20/] subitems. This technique produces desirable scale properties for the composite; the composite will have a mean of 0 and positive and negative values of the component may be easily recognized as above average or below average, respectively. The results of the factor analyses were used as a guide in creating the composites. The factor solutions provided information as to which subitems should enter a composite and whether a given subitem should carry a positive or negative weight.

The scaling procedure was only partially successful in significantly reducing the number of original variables. The items dealing with the functions of the UB program (PDQ 17, PIQ 25, PCQ 20) were not reduced at all. The other variables yielded acceptable composites but the total number of measures (32) was still rather high. It was felt that attempts at further reduction or forcing solutions to a smaller number of composites would be counterproductive. While the number of variables would decrease, the interpretability of the solutions and thus the meaningfulness of the composite variables would suffer.

Each set of composites will be briefly introduced below, however, Appendix G provides a more complete discussion of these composites. As the composites are encountered in later analyses they will be further examined. It should be noted that the composites are all computed on aggregate data. The level of aggregation depends upon the specific variable (see Table 8.7) but in most cases the aggregation was over all three staff categories.

Instructional Practices. This set of three composites was derived from question 28 of the PIQ which contained 11 subitems concerning various techniques of instruction. Project instructors were asked to rate on a 4-point scale (1 = don't use, 4 = use to a great extent) the extent to which they used a given instructional practice. The three derived composites may be roughly labeled as follows: (1) traditional formal methods, including

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[20/] Standardization of a variable involves subtraction of the mean followed by division by the standard deviation. This sample scale transformation yields a variable with a mean of zero and unit standard deviation. The standardization of the subitems prior to formation of the composites insured that all variables contributing to a component were similarly scaled.

lecture, lack of individualized instruction, competitive grading, and nongraded classes; (2) nontraditional formal methods, including programed instruction, ability grouping, and noncompetitive grading; and (3) informal methods, including open classrooms, instructional media, and seminars.

UB Functions. All three categories of project staff were asked to rank-order the importance, for both summer and academic year, of a set of seven project functions. These were: (1) tutoring/remedial instruction, (2) counseling, (3) liaison work with schools and community, (4) health services, (5) cultural enrichment activities, (6) social activities, and (7) parental involvement. Ranked values were derived for each subitem even if items were omitted. In the case of omitted items, the average of the unused ranks was assigned to omitted items. Thus 14 scores, 7 average summer ratings and 7 average academic year ratings are available for each project.

Instructor Experience. The instructor experience composites were computed by combining several separate PIQ items (11, 13, 14A, 15) that dealt with the experience and training of UB instructors. Two composite scores were derived from the four items. The composites reflect two aspects of experience and can be labeled as follows: (1) teaching experience outside UB, and (2) teaching experience and inservice training within UB.

Counselor Experience. A set of experience composites was also derived for the counselors. These composites are based on six items from the PCQ--11A, 12, 13, 14, 15A, and 16. They are labeled as follows: (1) practical counseling experience, and (2) college training in counseling.

Ratings of UB Students. All project staff were asked to rate students on 12 dimensions (PIQ 35, PDQ 34, PCQ 34). The derived set of composites, in which all item weights were positive, reduced the 12 attributes to three general scale values: (1) attributes and attention, (2) ability, responsibility, and independence, and (3) creativity and interpersonal relationships.

Student and Staff Relations. All project staff were asked to rate the quality of the relationships among various groups within the project (PDQ 28, PIQ 38, PCQ 32). The composites derived for this set of items were based on data aggregated within and across staff categories. Three composites, using positive weights, were computed from the set of five subitems: (1) staff relationships, (2) student with staff relationships, and (3) student with student relationships.

Staff Philosophy. The project staff members were asked to impose a weak ordering on the relative importance of 14 educational goals within their own philosophies of education. A set of *a priori* composites was derived for this item defining three scales: (1) development of skills and study habits, (2) development of interpersonal skills and self-control, and (3) development of achievement motivation and a sense of worth. These composites represent the means of the raw values of the selected subitems, and thus preserve the original scale.

High School and Postsecondary School Cooperation. A measure was obtained, from staff counselors and instructors, of the quality of the cooperation between the UB project and various educational institutions (PCQ 33A, PIQ 39A). This question consisted of six items, from which two *a priori* composites were developed: (1) cooperation with high schools, and (2) cooperation with PSE institutions. The composites were the means of the aggregated raw score responses to the appropriate subitems.

II. RELATIONSHIP OF PROCESS VARIABLES TO STUDENT OUTCOMES: DISCRIMINANT ANALYSES

The basic question addressed by this chapter involves possible associations between UB process measures and student outcomes. This question is explored in the current and following sections. The initial approach, taken in this section, is that of multiple discriminant analysis, while in Section III multiple regression analysis is used. As previously stated, discriminant analysis is a technique whereby known groups are maximally differentiated along one or more dimensions defined by independent linear combinations of a set of discriminator variables.

One set of *a priori* project groupings, based on established project characteristics, was defined in the previous section. Another approach to defining groupings of the projects is empirical clustering of the projects on selected sets of project measures. For the a priori clusters, a single measure defined a clustering of projects and six sets of clusters were obtained. The empirical clustering technique operates in a multidimensional framework by considering more than one variable at a time. Two sets of clusters were obtained (see below) by clustering on two different sets of outcome measures. The clusters were defined in terms of output measures instead of process measures for several reasons. The set of output measures is small, contains measures with the best data availability rates, and contains the most accurately measured and stable data (i.e., student data). The output measures can all be considered as performance measures and are similar while the process measures are a very diverse set. Clearly the process measures do not lend themselves to a simple categorization, and the clusters derived from them would probably not be simply interpretable. Finally, the a priori clusters which will also be used are related to the process measures and cover some of the same information.

The approach to discrimination suggested by these two sets of groupings is, therefore, quite different. Since the a priori project classifications involve characteristics of the project or the students in the project, the suggested discriminator variables are the student outcome measures. Conversely, since the empirical clusters are based on student outcomes, the appropriate discriminator variables are the project process measures. Although the cases will be treated separately, the establishment of a strong discrimination among groups by either of these two approaches would suggest a relationship between process and output.

Although some data were collected from 54 UB projects, the maximum number contributing to any of the discriminant analyses is 52. One project was eliminated because it had no students at the time of the survey, and another project was eliminated because it had no seniors (and thus no measures of PSE entry). All but one of the analyses are performed on data from less than 52 projects, however. The additional loss of projects is due to two factors: (a) for both a priori and empirical clusters, some groups contain so few projects that they were not considered; and (b) for analyses involving empirical clusters, some projects lack data on one or more of the project process variables in the discriminator variable set.

Since these analyses are exploratory, no attempt was made to resolve the loss of projects by data imputation or combinations of groups of projects. The minimum number of projects contributing to any discriminant analysis was 45, representing a 17 percent loss in analysis units from the original 54.

The large number of variables in each of the full sets of discriminator variables precluded the use of a full-model discriminant analysis.[21] Stepwise analysis was therefore used as an initial approach. In stepwise discriminant analysis, variables are added and deleted from the discriminant function, one at a time, on the basis of predetermined criteria. This addition and deletion terminates when none of the variables included in the discriminant function at that step meet the criterion for removal and none of the variables not included in the discriminant function meet the criterion for inclusion.

For all discriminant analyses conducted, the first step involved a forcing of all project input variables into the discriminant function, to control for the effect of these measures in distinguishing the project groups. After the first step, no additional constraints were placed on the solution other than the specified criteria for inclusion or exclusion from the function. This means that any input variable meeting the exclusion criterion could be removed from the final discriminant solution.

The criteria used for addition and deletion of variables from the solution was stated in terms of the partial F values[22] for each variable at a given stage of the sequential solution. A variable previously included in the function was deleted if the partial F value dropped below 1.0, and a variable not included in the equation was added if the partial F value was greater than 2.0. When several variables met the criteria for removal or inclusion at a given step, the following decision rules prevailed: (a) deletion of a variable always took precedence over addition of a variable;

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[21] A full-model analysis would include all discriminator variables simultaneously, and since the total number of variables approaches the number of projects, trivial solutions would be quite likely.

[22] The partial F value for a variable is an index of the degree of discrimination that is unique to that variable after the discrimination of other variables in the discriminant function has been taken into consideration (i.e., residual discrimination).

(b) when two or more candidates for deletion existed, the variable with the smallest partial F value was deleted; (c) when two or more candidates for addition existed, the variable with the largest partial F value was added.

Due to the very large number of discriminator variables relative to the total number of projects and the considerable latitude in selecting a best-fitting discriminant function provided by the stepwise approach, additional criteria were applied to specify the acceptability of a discriminant solution. A solution was defined as acceptable if both of the following conditions were met: (a) the number of project process variables entering the solution was no greater than the number of projects in the smallest group, and (b) the number of projects incorrectly classified as to group membership, as a result of the analysis, was less than half of the number that would be incorrectly classified by the "best" prediction based only on the knowledge of the sizes of the groups.[23/] The results of analyses which did not meet these criteria will not be reported.

A. Discrimination Among A Priori Project Groupings

A priori project measures provided six separate groupings of projects, each group consisting of from two to five groups of projects (see Table 8.8). Eliminating groups containing less than five projects, the group means on each of the 15 discriminator variables (8 characteristics of students in the project and 7 student outcome measures) are presented in Table 8.10. While an examination of group differences for the means of the individual variates does not necessarily reflect the potential success of the multivariate discriminant solution, the marked similarity of the group profiles for a particular classification dimension (as indicated in Table 8.10) does signal a high potential for failure. (If there is no discrimination among groups by any of the variables of the discriminator set, then

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[23/] For example, in the two-group case with 40 projects in group A and 10 projects in group B, the best prediction of group membership with no other information would be to classify all projects as being in group A. This classification would yield only 10 projects as misclassifications. In that case, an acceptable discriminant solution would be required to correctly classify at least 45 projects.

Table 8.10

AVERAGE VALUES OF PROJECT INPUT AND OUTPUT VARIABLES FOR EACH OF SIX *A PRIORI* PROJECT CLASSIFICATIONS

Classification Dimension	Level of Classification	Number of Projects[a]	Characteristics of Students in Project								Student Outcomes						
			9th Grade Academic GPA[b]	9th Grade Academic Course Load[c]	Percent of Poverty Level Students	Percent of Academic Risk Students	Number of Students in Project[d]	Percent of Male Students	Percent of 11th Grade Students	Percent of 12th Grade Students	Fall-to-Fall High School Continuation/ Completion Rate	Change in Academic GPA[e]	Change in Academic Course Load[e]	PSE Entry Rate[f]	Vocational/ Technical School Enrollment Rate[g]	2-Year College Enrollment Rate[g]	4-Year College Enrollment Rate[g]
Length of Project Operation	Less than 2 Years	9[h]	5.06	.66	.75	.41	55.8	.39	.42	.32	.93	.04	.05	.73	.16	.22	.61
	2 Years	8	4.91	.68	.73	.49	61.1	.37	.37	.52	.90	.13	-.07	.70	.11	.17	.73
	3 or more Years	34	5.02	.67	.73	.48	69.7	.48	.38	.48	.89	-.03	-.05	.61	.07	.15	.72
Project Sponsor	2-Year College	5[h]	4.91	.58	.73	.57	41.2	.43	.50	.36	.90	.15	.65	.48	.07	.29	.52
	4-Year College	46	5.00	.67	.73	.46	66.7	.46	.38	.46	.90	.00	-.05	.64	.09	.14	.73
Location of Target Population	City	6	5.01	.63	.68	.48	76.0	.55	.29	.44	.90	-.12	-.05	.64	.06	.18	.76
	Specific Area of City	8	5.09	.66	.64	.42	83.0	.44	.39	.46	.91	-.14	.00	.74	.09	.21	.72
	Rural	8	5.05	.71	.67	.45	55.6	.47	.43	.45	.91	.04	-.09	.54	.05	.20	.70
	City and Rural	27[h]	4.99	.67	.79	.47	60.3	.42	.40	.45	.89	.06	-.04	.65	.12	.13	.71
Race of Project Participants[i]	Predominantly Black	15	5.07	.68	.73	.43	75.5	.43	.33	.49	.92	-.04	-.05	.75	.09	.10	.82
	Black and White	13	4.99	.67	.78	.50	61.0	.44	.48	.43	.88	.09	-.06	.61	.13	.17	.64
	Native American	8[h]	4.73	.64	.69	.61	39.3	.43	.41	.41	.90	.10	-.06	.37	.08	.15	.59
	Spanish Speaking	14	5.06	.64	.70	.45	68.8	.47	.37	.47	.90	-.07	.01	.64	.05	.24	.69
Project Emphasis	Academic Skill Development	25	5.07	.67	.75	.43	63.2	.44	.38	.49	.88	.04	-.04	.62	.08	.17	.71
	Personal Development	6[h]	5.11	.68	.81	.45	67.7	.46	.45	.39	.95	.02	-.03	.75	.17	.15	.66
	Combination	19	4.89	.65	.69	.52	64.3	.45	.39	.44	.90	-.04	-.05	.62	.08	.16	.68
Coordination with other Educational Intervention Programs	No Coordination	24[h]	4.95	.65	.74	.50	64.8	.43	.40	.43	.91	.00	-.03	.57	.09	.16	.72
	Some Coordination	29	5.04	.68	.71	.45	63.0	.46	.38	.48	.89	.01	.05	.68	.09	.18	.69

NOTE: Average values given are raw score means. Since one project had no students, the maximum number of projects within any classification dimension will be 53.

[a] The number of projects for a given classification dimension will not necessarily total 53, since miscellaneous categories were not considered.

[b] A value of 5.00 represents a percentile rank of 50.

[c] Academic course load represents the proportion of all credits attempted that were classified as academic courses.

[d] Determined as of fall 1973.

[e] Change is computed as current grade values minus 9th grade values. As such, positive change represents a gain.

[f] Computed only for the subset of 12th graders in a project.

[g] Computed only for the subset of PSE entrants in a project.

[h] This number is reduced by one project for computation of PSE-related measures, due to the fact that one project had no 12th graders.

[i] Predominantly black projects were those in which 80 percent or more of the participants were black. Black and white projects were those containing primarily white and black participants with no more extreme a proportional distribution than 79 percent and 21 percent. Native American projects were those in which greater than 10 percent of the participants were Native American. Spanish-speaking projects were those in which 10 percent of the participants were either Mexican American or Puerto Rican.

there exists no linear combination of those variables that will distinguish among the groups).

There were, in fact, no solutions among the six discriminant analyses performed on these data that met the stated criteria for an "acceptable" solution. The solutions were, in fact, unacceptable from an entirely different perspective. In over half of the solutions, the only variables included in the final discriminant model were the control variables related to student preprocess characteristics. This suggests that there is, at best, a very weak relationship between whatever UB processes are reflected in the *a priori* classification of these projects and the student outcome variables considered here, after accounting for relationships with other student characteristics. In light of the failure to obtain acceptable solutions, given the latitude allowed by the stepwise approach, no additional attempts to analyze these data with rational models were attempted.

B. Discrimination Among Empirical Project Groupings Based on Three Outcome Measures

In this subsection the UB process measures will be examined for their ability to account for the different profiles of performance revealed by one of the empirical cluster solutions. The cluster solution was based on three outcome measures: (1) change in academic GPA; (2) proportion of twelfth graders entering PSE; and (3) change in proportion of attempted academic courses. (Fall-to-fall HS continuance/completion rate was not used because of the limited variability of this measure over projects.) Given the large set of process measures available and the need to consider and adjust for differences on the preprocess measures the initial analyses of these data were performed through stepwise, multiple discriminant analysis.

1. The Project Clusters

The empirical cluster solution reported here separated the projects into seven groups on the basis of output measures that allowed classification of more effective and less effective projects. One resulting group consisted of only one project and was eliminated from further analysis. Table 8.11 presents the standardized and raw cluster

Table 8.11

RAW AND STANDARDIZED CLUSTER MEANS FOR CLUSTERING SOLUTION BASED ON THREE OUTCOME MEASURES

Variable		Cluster					
		A	B	C	D	E	F
PSE Entry Rate for 12th Graders	Std[b/]	-1.05	0.53	0.17	0.66	0.58	-2.00
	Raw	0.42	0.73	0.66	0.76	0.74	0.24
Change in Academic GPA[a/]	Std[b/]	-0.16	0.80	-0.51	-1.31	0.34	0.27
	Raw	-0.03	0.19	-0.10	-0.28	0.09	0.07
Change in Academic Course Load[a/]	Std[b/]	-0.57	-0.77	-0.66	0.81	0.78	1.11
	Raw	-0.10	-0.12	-0.11	0.04	0.03	0.06
Number of Projects		9	11	8	9	10	5

NOTE: These values are based on a total of 52 projects. Two projects were eliminated--one because it had no students, the other because it defined its own outlying group.

[a/] Change is computed from ninth grade to current grade.

[b/] These are cluster averages of standardized values, computed by subtracting the grand mean from each observation and dividing by the standard deviation.

means for the outcome measures for each of the remaining six project groupings. The means of standardized variables, reported in Table 8.11, allow comparison across variables since all variables have been transformed to a similar scale. The standardized values express the distance of the cluster mean, in standard deviation units, from the grand mean over projects. The sign of the cluster mean indicates whether it is greater or less than the grand mean. While the means of standardized measures allow cross-variable comparisons, they may be misleading when making within-variable comparisons. The standardized means reflect only relative variability within a measure, and raw cluster means are necessary to establish absolute variability. While there is reasonable absolute variability among clusters for PSE entry rate, it can be seen from Table 8.11 that the absolute between-cluster variability for the academic change measures is not great.[24]

The examination of results presented in Table 8.8 indicates that the clustering has divided the projects into distinct groups. Project clusters can be labeled as more effective or less effective by considering the cluster means on each of the three outcome measures.[25] Three project clusters (B, D, and E) have large (greater than .50) standardized cluster means for PSE entry rate and at least one other outcome measure. These clusters can be labeled as the "more effective" project clusters. The remaining project clusters do not show as consistent a pattern. Clusters A and F have large negative standardized mean values for PSE entry rate and Cluster C has large negative values for both the change in grade point average and change in proportion of academic courses attempted. While this group of three clusters is not as homogeneous as those labeled more effective, they are in general, "less effective" than the other clusters.

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[24] For example, the standardized cluster means for change in academic course load range from .8 standard deviations below the grand mean to 1.1 standard deviations above. This difference of almost 2 standard deviation units represents only a small difference in terms of actual increase in proportion of academic courses taken. The lower and upper extreme cluster were characterized by students who, from ninth grade to current grade, attempted 12 percent fewer academic credits and 6 percent more academic credits, respectively. Such a small difference probably has little practical importance.

[25] Examining the cluster means one at a time loses some of the multivariate information used by the clustering process but it allows easier interpretation of the results.

Beyond this dichotomy of more effective and less effective clusters of projects, the pattern of scores of various outcome measures by clusters is of interest. Figure 8.1 displays graphically the standardized data from Table 8.11. The three more effective project clusters (B, D, and E) all show above average and similar PSE rates but vary in their performance on the remaining outcome variables. Only Cluster E is above average on all three outcome measures. The less effective project clusters (A, C, and F) show a wider pattern of variation but remain consistently at or below average for two of the three outcomes. Only one cluster of projects in this group, A, is consistently below average on all three outcome measures. Two project clusters, A, the least effective, and E, the most effective, show large and consistent differences in outcomes. The remaining clusters show less consistent patterns but are distinctly different from one another.

2. Discrimination Among Clusters

Table 8.12 presents the set of variables selected in the stepwise discriminant process that best separates the clusters based on the three outcome measures--PSE entry rate, change in GPA, and change in academic course load. This table presents the cluster means of the raw and standard scores for these variables. Additionally, each variable has been assigned a discriminability rank, which may be interpreted as an index of the degree of discrimination that is unique to a given variable after partialing out the discrimination of the other variables. A rank of 1 indicates the variable with the most unique discriminating power and a rank of 7 indicates the least. As indicated in the final two rows of the tables, not all of the projects used to determine the clusters were used in the discriminant analysis;

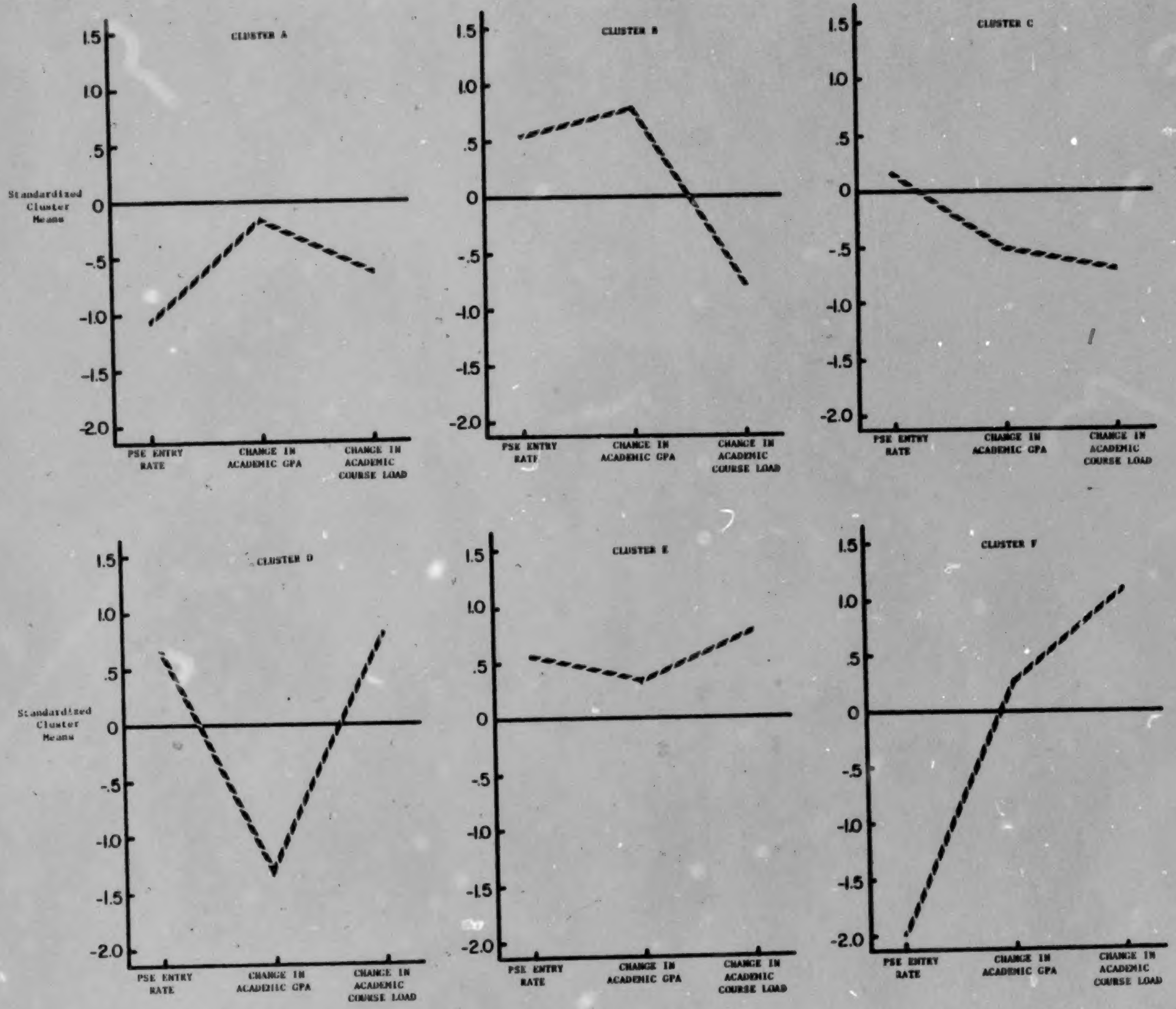

Figure 8.1. Profiles of Clusters Empirically Derived From Three Student Outcome Measures.

Table 8.12

CLUSTER MEANS FOR VARIABLES SELECTED IN DISCRIMINANT ANALYSES OF THE OUTCOME MEASURE CLUSTERS

Variable	Discriminability Rank[a/]		A	B	C	D	E	F
Project Size	1	Std[b/]	-0.44	0.00	0.19	1.06	-0.21	-0.92
		Raw	50.56	63.91	69.33	95.11	57.50	36.40
Emphasis placed on academic year training and remedial instruction	2	Std[b/]	-0.47	-0.22	0.22	0.72	0.34	-1.18
		Raw	6.57	6.82	7.27	7.77	7.39	7.85
Emphasis placed on academic year medical services	3	Std[b/]	0.41	-0.06	-0.15	0.27	-0.38	-0.34
		Raw	3.86	3.39	3.30	3.72	3.07	3.11
Proportion of project students labeled poor	4	Std[b/]	-0.44	0.50	0.29	-0.22	0.00	-0.52
		Raw	0.67	0.80	0.77	0.70	0.73	0.66
Proportion of courses attempted that were academic	5	Std[b/]	0.12	0.41	-0.30	-0.03	-0.37	-1.13
		Raw	0.67	0.69	0.69	0.66	0.64	0.58
Ninth grade GPA	6	Std[b/]	-0.54	0.46	-0.42	0.66	0.23	-1.04
		Raw	4.85	5.12	4.88	5.17	5.06	4.72
Proportion of project that is male	7	Std[b/]	0.62	-0.40	-0.27	0.27	0.08	-0.42
		Raw	0.52	0.39	0.41	0.48	0.46	0.39
Number of projects in the cluster			9	11	8	9	10	5
Number of projects in the discriminant analysis			8	10	8	9	8	4

[a/] The rank value is determined by the relative amount of explained variance attributable to each variable, when all variables are considered simultaneously.

[b/] These are cluster averages of standardized values, computed by subtracting the grand mean from each observation and dividing by the standard deviation.

this reduction is attributable to unavailable data for the project process measures. In this case, five projects were lost.

The depicted solution suggests that the great bulk of the predictable variability in outcome performance comes from preprocess differences. Five of the seven variables included in the discriminant function are preprocess measures that may reflect student selection and project size. The only process variables entering the solution are two items dealing with the emphasis placed by the project on (a) tutoring and remedial instruction and (b) medical/dental health services or referrals during the academic year program. The scale of these items is from 1 = least emphasized to 8 = most emphasized.

Figure 8.2 displays the average profiles for the effective and ineffective projects over these variables. This display of the data considers only univariate distinguishability among the clusters while the discriminant solution considers the simultaneous discrimination of all variables. Hence, in interpreting the simple cluster means, one should be aware that better discrimination is available by considering differentially weighted linear functions of the data. Given this caution the univariate comparisons can serve to point out the broad features of the relationships of these variables to project effectiveness as defined by the cluster solution. The results indicate that student selection factors are differentially associated with program effectiveness.

Comparison of the two averaged profiles in Figure 8.2 reveals several points. There is a large difference, 1.04 standard score units, in the ninth grade academic GPA between the two types of projects, the more successful projects being characterized by students with higher GPAs. Additionally, the more effective programs tend to be larger and to contain a larger proportion of poor students. Both process variables entering the discriminant solution deal with academic year program functions. The more effective projects tend to give more than average emphasis to tutoring and remedial instruction and slightly less than average emphasis to medical services during the academic

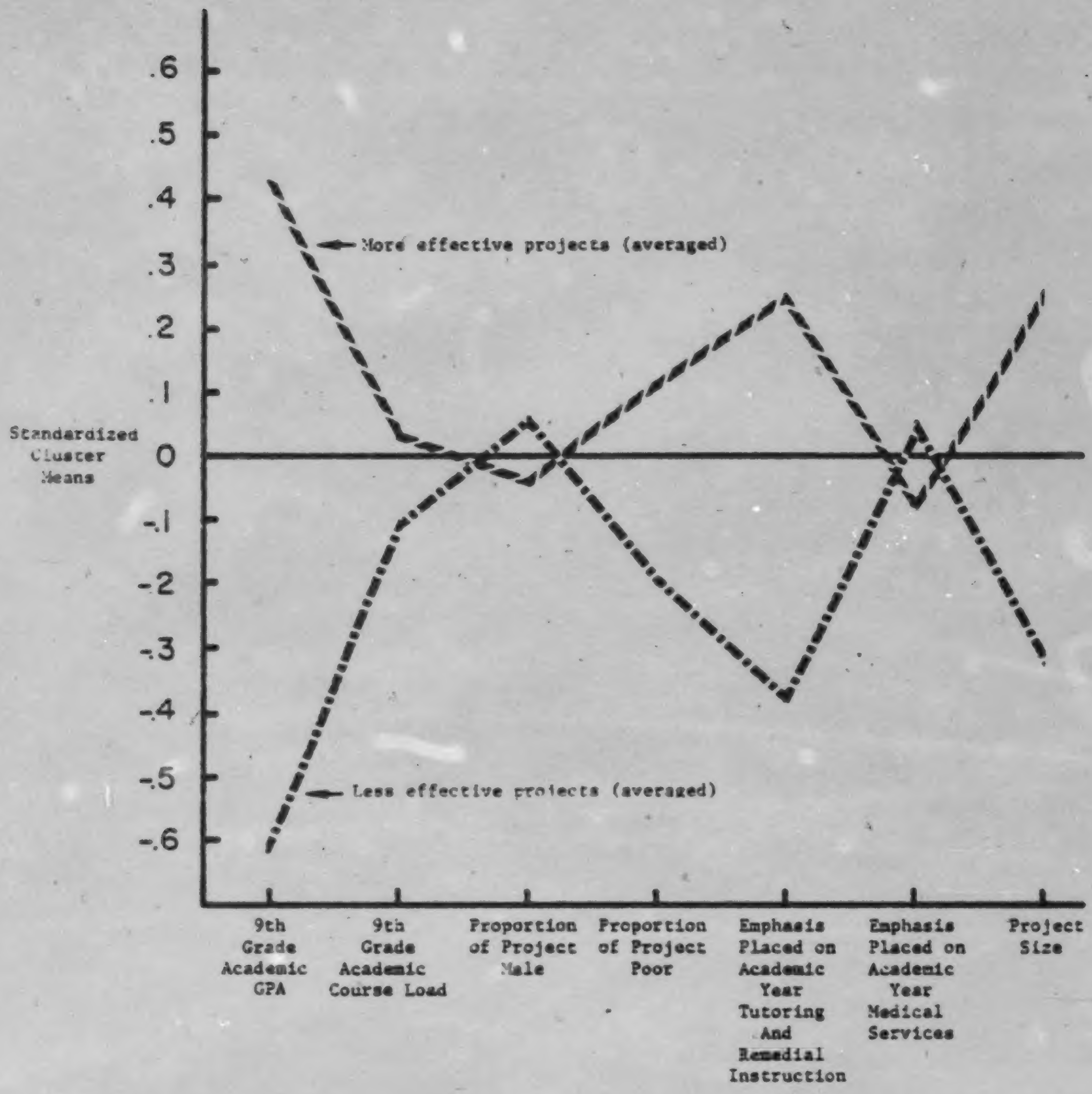

Figure 8.2. Profiles of the More Effective and Less Effective Project Clusters for the Set of Discriminant Function Variables.

year. Reference to the raw cluster means in Table 8.12 indicates a very small absolute range of variation for the medical services variable. The discrimination contributed by this variable is over a very narrow range and probably of very little practical importance. There is a somewhat wider variation in the cluster means for the tutoring/remedial instruction variable.

D. Discrimination Among Empirical Project Groupings Based on PSE Outcomes

A second set of project clusters was derived by analyzing only those outcome measures related to PSE entry. This set of output variables contains four measures: (1) proportion of twelfth graders entering PSE; (2) proportion of PSE entrants enrolling in vocational/technical schools; (3) proportion of PSE entrants enrolling in 2-year colleges; and (4) proportion of PSE entrants enrolling in 4-year institutions. This subsection examines the nature of the empirical cluster solution, which reflects the effectiveness and pattern of student placement in PSE institutions and the relationship of project process measures to cluster membership.

1. The Project Clusters

The second clustering solution groups the projects by examining PSE entry rates and the pattern of entry into various kinds of PSE. The obtained solution indicates five basic clusters of projects. The five clusters represent only 49 of the 54 sampled projects. One project was eliminated because it had no students at the time of the survey and another project was eliminated since it had no seniors. The three remaining projects were eliminated because they were outliers in the obtained cluster solution.[26/] Table 8.13 presents cluster means of the standardized and raw PSE measures. With the exception of Vocational/Technical School placement, the clusters show reasonably wide absolute variation in raw mean variables. Examination of this cluster solution reveals that there is considerable variation in the PSE

[26/] These three projects form two outlying clusters, one with two members and one with a single member. Both clusters showed high PSE rates with rather high rates of vocational/technical school placement.

Table 8.13

RAW AND STANDARDIZED CLUSTER MEANS FOR CLUSTERING SOLUTION BASED ON POSTSECONDARY MEASURES

Variable		Cluster				
		H	I	J	K	L
PSE Entry Rate[a]	Std[c]	0.12	0.64	-1.21	-0.07	-2.04
	Raw	0.65	0.75	0.39	0.61	0.23
Vocational/Technical School Placement Rate[b]	Std[c]	-0.02	-0.34	-0.40	-0.28	0.02
	Raw	0.09	0.04	0.04	0.05	0.09
2-Year College Placement Rate[b]	Std[c]	0.06	-0.50	-0.92	2.31	0.43
	Raw	0.17	0.08	0.02	0.53	0.23
4-Year College Placement Rate[b]	Std[c]	0.18	0.71	0.75	-1.51	-1.59
	Raw	0.75	0.88	0.89	0.34	0.32
Number of Cases[a]		17	17	5	5	5

NOTE: Only 49 cases are reported here--one project had no students, another had no seniors, and three projects were labeled as outliers in the clustering solution.

[a] This rate is computed for twelfth graders only.

[b] This rate is computed for PSE entrants only.

[c] These are cluster averages of standarized values, computed by subtracting the grand mean from each observation and dividing by the standard deviation.

entry rates and the type of PSE placement that occurs. The five clusters are categorized below.

Cluster H: average PSE entry rates with an average placement pattern.

Cluster I: high PSE entry rates with relatively high placement in 4-year institutions.

Cluster J: low PSE entry rates with relatively high placement in 4-year institutions.

Cluster K: average PSE entry rates with relatively high placement in 2-year institutions.

Cluster L: very low PSE entry rates with above average placement in 2-year institutions.

A graphic presentation of these data is given in Figure 8.3. The figure reveals that the level of variation among clusters for Vocational/Technical School placement is much smaller than for the other measures.[27/] The figure also shows that Clusters I and J have fairly similar profiles with the exception of the very different PSE entry rates. In general, these data suggest that the entry rate per se does not determine the type of PSE institution in which the UB students enroll. That is, project clusters with relatively high as well as relatively low PSE entry rates both show above average proportional placement into 4-year institutions. Similarly, placement in 2-year institutions is widely spread over projects with similar levels of PSE entry rates. The derived clusters do seem to distinguish plausible groups of projects; they define a broad set of PSE outcome patterns and provide a tractable classification scheme for relating process variables to different patterns of PSE placement.

2. Discrimination Among Project Clusters

A second discriminant analysis was performed based on the project groupings derived from clustering the PSE entry pattern measures. Table 8.14 presents the standardized and raw scores for the variables included in this discriminant solution: four preprocess variables and two process measures. As seen in this table, two projects were lost

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[27/] The outlier projects which are not presented did, however, show much higher proportional placement in vocational/technical schools.

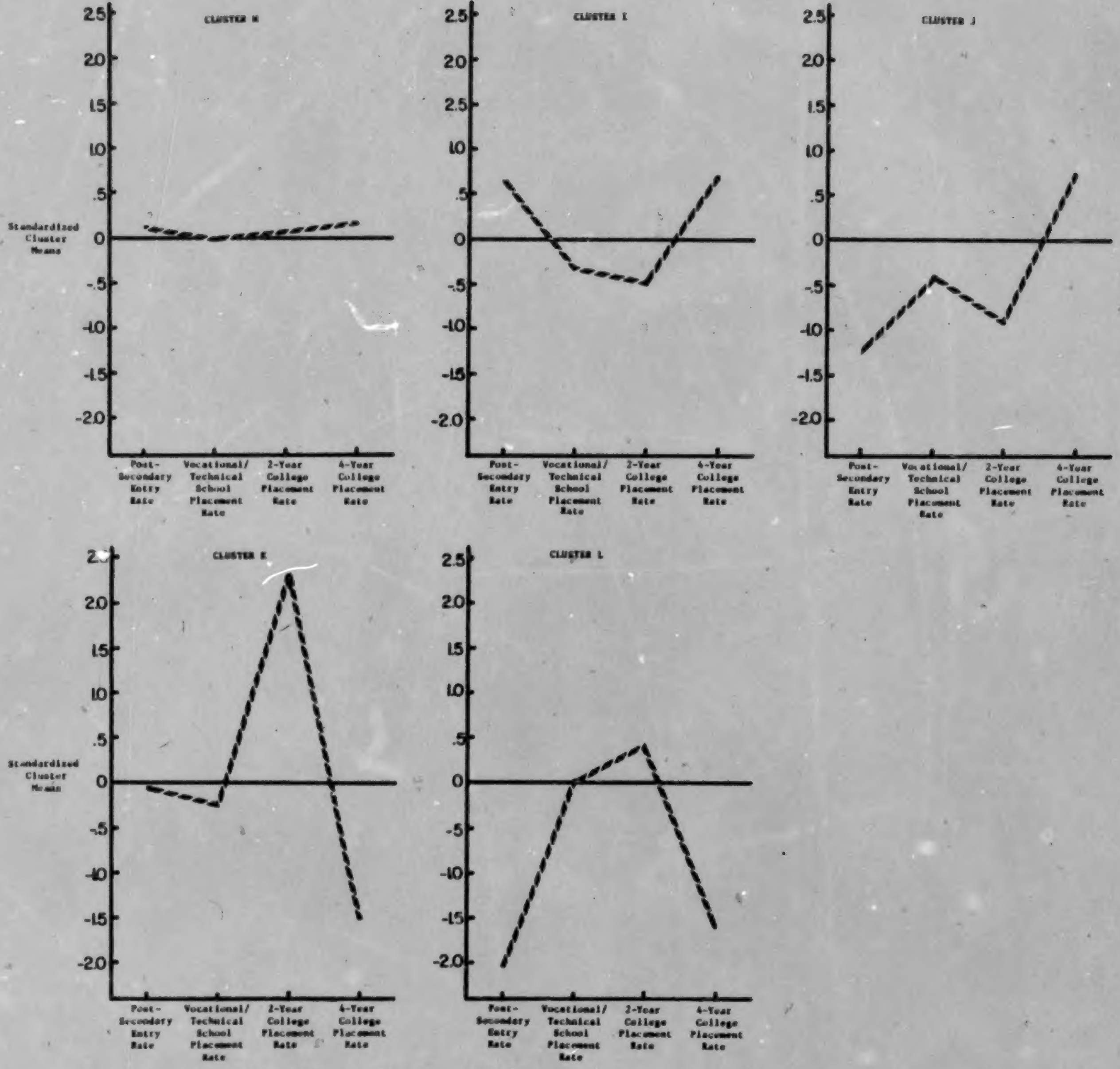

Figure 8.3. Profiles of Project Clusters Empirically Derived From Four PSE Outcome Measures.

Table 8.14

CLUSTER MEANS FOR VARIABLES SELECTED IN DISCRIMINANT ANALYSES OF THE PSE OUTCOME MEASURE CLUSTERS

Variable	Discriminability[a]		Cluster				
			H	I	J	K	L
9th Grade GPA	4	Std[b]	0.10	0.46	-0.88	0.29	-1.12
		Raw	5.03	5.12	4.76	5.08	4.70
Proportion of project students that were academic risks	5	Std[b]	-0.10	0.22	1.11	-0.12	0.94
		Raw	0.46	0.40	0.64	0.45	0.62
Proportion of project in 12th grade	3	Std[b]	-0.34	0.32	-0.83	0.69	0.62
		Raw	0.41	0.50	0.34	0.55	0.54
Number of students in project	1	Std[b]	-0.13	0.86	-0.71	-0.25	-0.96
		Raw	59.90	89.24	42.60	56.40	35.20
Relationships among staff members	6	Std[b]	0.18	0.11	-0.03	0.30	-1.14
		Raw	0.33	0.21	-0.05	0.56	-2.11
Emphasis upon cultural enrichment during the academic year	2	Std[b]	0.20	-0.28	-1.14	0.42	0.59
		Raw	4.59	4.16	3.40	4.78	4.93
Number of cases in the cluster			17	17	5	5	5
Number of cases in the discriminant analysis			16	15	5	4	5

[a] The rank value is determined by the relative amounts of explained variance attributable to each variable, when all variables are considered simultaneously.

[b] These are cluster averages of standardized values, computed by subtracting the grand mean from each observation and dividing by the standard deviation.

from the analysis due to missing or indeterminate information regarding the process measures. After adjusting for the preprocess measures, the process measures which entered the discriminant function were (a) a composite measure of staff relationships and (b) a measure of emphasis of cultural enrichment activities during the academic year (scaled from 1 = least emphasized to 8 = most emphasized).

The interpretation of the impact of the preprocess measures is not difficult but the inclusion of these two particular process measures causes some confusion. The profiles of the standardized means of the discriminant function variables for the five clusters are displayed in Figure 8.4. It is apparent that the staff relations composite variable serves primarily to separate one cluster (L) from the other four. Emphasis on cultural enrichment activities does separate the clusters and seems to be able to separate 4-year placement projects (Clusters I and J with relatively low emphasis) from the remaining clusters (with relatively high emphasis). The meaning of this separation in terms of project processes is another question on which the obtained solution sheds little light. Consideration of the range of variation in the cluster raw score means for the process measures (Table 8.14), especially the emphasis-of-cultural-enrichment variable, indicates that only a narrow range of values occurs; variation across such a narrow band is difficult to interpret even though it provides some statistical discriminability. The preprocess measures also discriminate between clusters. For example, Cluster I and J are both characterized by relatively high rates of placement in 4-year colleges, but Cluster J has a low overall rate of PSE entry while I has relatively high overall entry rate. Cluster I, however, has started with somewhat of an advantage--higher ninth grade GPA's and fewer academic risks among participants. A similar comparison can be made for Clusters K and L in regards to 2-year college placement.

D. Summary of Discriminant Analysis Results

It does not seem necessary to attempt development of a strong case for the existence and impact of preprocess differences as a result of the

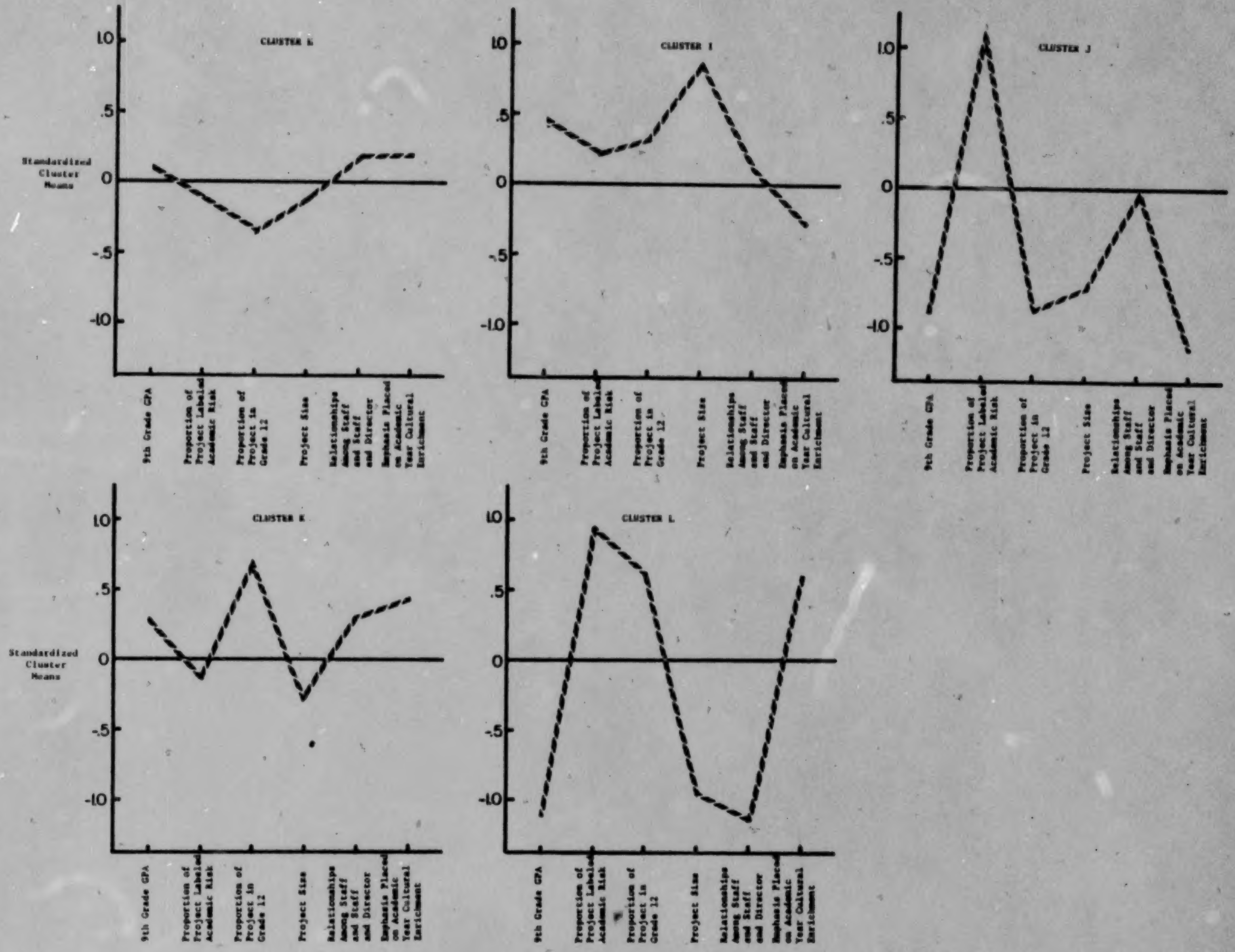

Figure 8.4. Profiles of the PSE Outcome Clusters for the Set of Discriminant Function Variables.

analysis presented in this section. It would be very surprising to find they did not exist. The surprising aspect of all the solutions is the lack of a consistent set, or of even a modest number, of process variables in the solutions. No evidence appears to relate these process measures to project outcomes with the exception of the few listed. It may well be that the initial preprocess differences in students from project to project are sufficiently great and sufficiently discriminating so as to overpower any relationship of process measures to outcomes.

The only cue that appears from these results, and it is a faint one, is that certain academic year activities may relate to the outcome measures. It may be more meaningful to interpret the appearance of academic year variables as indicators of the level of activity of the academic year program. That is, the inclusion of measures of emphasis of academic year processes, together with the notable omission of summer processes, may be evidence that it is the level of activity of the academic year program, and not a specific function or process, that discriminates among project clusters. Another piece of evidence supporting this logic is the consistent appearance of project size as a discriminating measure. Project size (i.e., the number of students enrolled) was measured in October and it may be that the measure reflects, at least in part, the activity level of the academic year program.

The findings presented here must be tempered by consideration of the analytic technique used. The use of stepwise procedures can capitalize on chance sample fluctuations in the data and provide solutions that are strictly data dependent. It is sound practice to replicate models derived from stepwise procedures; sometimes this is possible by using split-half techniques, but due to limited data this is not possible here. These results should not, therefore, be considered as presenting final models but as providing initial hypotheses which may be subsequently pursued.

In the next section, the relationships of process and outcome will be further examined in a slightly different light, using the technique of multiple regression analysis. In the current section, a multivariate examination of the outcomes was undertaken. By examining the set of outcome measures simultaneously the analysis is more sensitive to patterns and interactions among the outcomes, while in section III the outcome variables will be examined one at a time. Although the regression approach loses some of the appeal of multivariate consideration of the outcome measures, it gains by the sensitivity and flexibility with which it examines the relationships of the single outcome measure to the process variables. In the regression procedures a more detailed analysis can be accomplished by going beyond the simple relation of cluster membership to process variables that has been examined here.

III. RELATIONSHIP OF PROCESS VARIABLES TO STUDENT OUTCOMES: REGRESSION ANALYSES

A number of multiple regression analyses were conducted to determine if the variation in the separate project outcomes could be explained by variations in project characteristics and processes, after controlling for project input. The project level outcome variables examined in the regression analyses were: average change in academic GPA, average change in academic course load, percent entering PSE institutions, percent enrolling in 4-year colleges, percent enrolling in 2-year colleges, percent enrolling in vocational/technical schools, and fall-to-fall HS continuance/completion rate. As specified previously in this chapter, most of these measures show sufficient variation between projects to function adequately as criterion variables.

There were 54 projects sampled in the study, and most of these projects provided available data for all of the outcome and predictor variables. None of the analyses, however, are based on more than 50 projects. Two projects were dropped from the analyses due to a lack of students or a lack of twelfth graders as previously discussed. Other projects were dropped when variables in the predictor set were missing. In some of the reported analyses, missing data were imputed by regression procedures for a few independent variables. In such cases, the imputed value was the value predicted by a regression equation derived for projects with no missing data. These imputations were made in order to prevent further deterioration of the data base.

Since many variables were candidates for the regression equations, the first set of analyses employed stepwise procedures. The stepwise regression involved entering a fixed set of project input variables (percent academic risk, percent poverty status, and percent male). These three project input variables were expected to relate to the various outcome variables in differing degrees as well as to project process variables, as suggested by the results of the discriminant analyses reported in the previous section. Thus, they were considered as control variables to be entered initially into all stepwise regressions and to be presented in the final stepwise solution. The function served by these control variables was to adjust the UB process variables for differences among projects in student inputs. The remaining process and preprocess variables were then allowed to enter the regression equation in a stepwise manner.

The particular stepwise procedure used empirically selects independent variables that yield a statistically significant (.10 level of significance) increment in the regression sum of squares above that already obtained due to variables previously entered in the model. At each step, variables previously entered (except for the three control variables) are also checked for significance at the .10 level and are dropped from the model if they no longer reach this level. When no variable remains that significantly increments the regression sum of squares, the procedure terminates. Each of the seven outcome variables was regressed on the three fixed project input variables and then on whatever subset of the 36 additional process or input variables that could be added to these three fixed variables in the stepwise procedure. These additional 36 variables are the project level composites discussed earlier in this chapter.

A choice had to be made between applying sampling weights in the regression analyses or performing unweighted analyses. Although the probability of a project being included in the sample is not constant across projects, the project weights are reasonably homogeneous in that no extremely high or low project weights exist. The difference in results between the two strategies was examined for a number of data sets, and the differences in the estimated regression parameters for weighted and unweighted analyses were of small practical significance. Most importantly, the substantive interpretations of the weighted and unweighted regressions were identical.

A logical argument can also be made for using unweighted regression analyses. Large projects were selected into the sample with a higher probability than small projects, which is reflected in smaller sampling weights for the larger projects. On the other hand, larger projects provide a greater number of students and staff members on which to construct project level variables, and therefore observations from the larger projects should be more stable and, for this reason, should be given greater weight relative to observations from small projects. Sampling procedure dictates the assignment of less weight to observations from large projects but the data reliability considerations suggest giving more weight to observations from large projects. In a very general sense, these two competing demands indicate that unweighted analyses may be most appropriate for this data set.[28/] In any event, as previously mentioned, weighted and unweighted regression analyses showed no practical differences.

Another problem in analyzing data from a complex probability sample is that the standard error of any statistic is much more difficult to estimate than when using a simple random sample. If the clustering effect in a stratified multistage sample increases the variance of an estimate to an extent that is not offset by the gain in efficiency brought about by stratification, then the standard error of a statistic estimated from the complex sample can be considerably larger than the comparable standard error obtained from a simple random sample of the same size. It would be expected, however, that the clustering effect at the project level would be less than the

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[28/] Technically, the situation is as follows. The regression parameters for an unweighted analysis are estimated as $\beta = (X'X)^{-1}X'y$, and the regression parameters for a weighted analysis are estimated as $\beta = (X'DX)^{-1}X'Dy$, where X is the n by p observation matrix for the independent variables, y is the vector of outcome values, and D is a diagonal weighting matrix. For the present situation it is suggested that two diagonal weighting matrices should be considered jointly and that the product of these two diagonal matrices will be close to a scaler matrix, aI. That is, $D = D_1D_2 \approx aI$ where D_1 is a diagonal matrix based upon sampling weights and D_2 is a diagonal weighting matrix based upon the reliability of the measurements. Consequently, $(X'Dx)^{-1} X'Dy = a^{-1}(X'X)aX'y = (X'X)^{-1}X'y$.

clustering effect when the student is the unit of analysis. For some selected statistics presented in Chapter 5, the average design effect, (DEFF),[29] using the project as the unit of analysis, is only slightly greater than one, suggesting that the standard errors for these estimates from the complex study sample is only slightly greater than that for a simple random (equally weighted) sample. This does not, however, directly imply that the DEFF for regression parameters is close to one. In order to be conservative, an estimated parameter will be considered as significantly different from 0 at the .05 level if the significance level based upon assumptions of a simple random sample is .025 or less.

A. Stepwise Solutions

A summary of each of the seven stepwise regression analyses is presented in Table 8.15. This table indicates for each outcome variable: (1) the sign of the standard regression weight for each independent variable in the final solution (which reflects the sign of the partial correlation of that variable to the criterion variable), (2) the proportion of outcome variance in a given outcome measure explained by the three control input variables and any other input variable entering the final regression equation (as measured by the squared multiple correlation, R^2), and the increment in proportion of variance accounted for by the stepwise addition of project process variables.

The most predictable outcome measure was fall-to-fall HS continuance/completion rate, yielding a total R^2 of .706. The least predictable outcome measure is percent entering 2-year PSE institutions, with a total of R^2 of .339. The input variables considered separately yield the highest contribution ($R^2 = .389$) in predicting change in academic course load and the lowest contribution in predicting change in academic GPA ($R^2 = .049$). Program variables yield the highest increment in R^2 (.565) to the prediction of fall-to-fall HS continuance/completion and yield the lowest incremental R^2, (.186) to the prediction of change in academic course load.

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[29] Design effect is the ratio of the variance of the estimate for sample design to the variance of the estimate for a simple random sample of equivalent size (see Appendix B).

Table 8.15

SUMMARY OF STEPWISE REGRESSION ANALYSES FOR SEVEN PROJECT OUTPUT MEASURES

	Relationship to Project Output Measures in Final Regression Equation						
Project Input and Process Measures	Change in Academic GPA	Change in Academic Course Load	Fall-to-fall Continuance/ Completion Rate	Total PSE Entry Rate	Vocational/ Technical Entry Rate	2-Year College Entry Rate	4-Year College Entry Rate
Process Measures							
Instructional Practices Used							
Traditional Formal Methods					(-)		
Nontraditional Formal Methods			(-)				
Informal Methods		(-)					
Project Emphasis on Functions							
Tutoring/Remedial Instruction (Summer)		(-)				(-)	
Counseling (Summer)						(-)	
Liaison Work with Schools and Community (Summer)							
Health Services (Summer)	(-)				(-)		(-)
Cultural Enrichment Activities (Summer)							
Social Activities (Summer)							
Parental Involvement (Summer)			(+)				
Tutoring/Remedial Instruction (Academic Year)				(+)			
Counseling (Academic Year)							
Liaison Work with Schools and Community (Academic Year)			(+)		(-)	(-)	
Health Services (Academic Year)							
Cultural Enrichment Activities (Academic Year)					(-)		
Social Activities (Academic Year)							(-)
Parental Involvement (Academic Year)			(+)	(+)			
Staff Experience/Training[a]							
Instructor Teaching Experience Outside UB							
Instructor Teaching Experience and Inservice Training With UB							
Staff Ratings of UB Students							
Attitudes and Attention							
Ability, Responsibility, and Independence		(-)	(-)				
Creativity and Interpersonal Relationships							
Intraproject Relationships							
Among Staff						(+)	
Students with Staff							(-)
Among Students							
Staff Ratings of Important Aspects of Education							
Development of Skills and Study Habits							
Development of Interpersonal Skills and Self Control							
Development of Achievement Motivation and Sense of Worth		(+)	(-)				
School Cooperation							
High Schools	(+)						(-)
PSE Institutions	(+)				(-)		
Miscellaneous							
Percent of Instructor Time Spent Tutoring			(-)				(-)
Project Size (Number of Participants)	(-)			(+)			(+)
Input Measures							
Percent Male	(-)	(+)	(+)	(-)	(-)	(-)	(+)
Percent Poor	(+)	(-)	(+)	(+)	(+)	(-)	(+)
Percent Academic Risk	(-)	(-)	(-)	(-)	(+)	(+)	(-)
Ninth Grade GPA							
Ninth Grade Percent Academic Course Load		(-)		(+)	(+)		
Percent Eleventh Graders							
Percent Twelfth Graders							
Number of Input Variables Selected For Final Solution	3	4	3	4	4	3	3
Proportion of Variance Explained by Input Variables	.049	.389	.141	.361	.151	.055	.197
Number of Process Variables Selected for Final Solution	4	4	7	3	5	4	6
Proportion of Variance Explained by Process Variables	.524	.188	.565	.219	.316	.285	.403
Total Proportion of Variance Explained by Final Solution (R^2)	.573	.577	.706	.580	.467	.339	.600

NOTE: All analyses were conducted using 50 projects. The first three listed input measures were forced into the regression equation, and other process and input measures were subsequently allowed to enter the equation in a stepwise manner. The table shows the signs of the partial relationships of the variables in each final regression equation, all variables having been scaled so that direct relationships of the constructs to the output measure were given by positive relationships. All variables in the final equations were characterized as having "significant" partial relationships to the output variable ($P \leq .1$).

[a] Additonal measures of staff experience or training were obtained for counselors and directors, but were not used in the analyses due to the extent to which the data were indeterminant.

In general, percent of academic risk students in the project seemed the most important of the three project input variables in predicting the outcome variables; however, this varied from analysis to analysis The only preprocess variable, other than the three control variables, entering any of the regression equations was the average with grade academic course load of project participants. As can be seen in Table 8.15, the pattern of project variables entering the seven regression equations was not conceptually reasonable; totally different models were selected for the prediction of conceptually similar and correlated outcome variables. Moreover, the nature of the partial correlations between certain process variables and student outcomes does not yield to a simple interpretation. Notice, for example, that an emphasis of tutoring and/or remedial instruction during the summer program is negatively related to change in academic course load from ninth to current grade. This is most difficult to explain in terms of an "effect" of this UB activity on the student outcome. A more reasonable interpretation of this relationship would be that emphasis on this function was needed by those projects serving students who had decreased their academic course load and that such an emphasis was less needed by projects serving students who had maintained or increased their academic course load. The only process variables showing only positive partial relationships with one or more outcome measures are emphasis of parental involvement (in summer and academic year program), emphasis of tutoring and/or remedial instruction during the academic year, and relationships between students and staff.

It should be kept in mind that the stepwise procedure, based on 50 projects, was allowed to select the best set from 36 project variables and hence the stepwise regression process could easily be capitalizing on sampling fluctuations in the correlation matrix. Stepwise solutions should always be viewed with caution unless they have been cross-validated on another independent sample to determine if the results are stable. The sample of 50 projects is not large enough to allow such a cross-validation study by split-half techniques. The stepwise regressions do indicate, however, that some process variables enter the stepwise regression equations in varying degrees and patterns, and that relationships do, therefore, exist between process and student outcomes for this sample of projects.

B. Rational Model Testing

Further reflection on the results of the stepwise regressions described above and the nature of the UB project variables led to a decision to concentrate on testing specific hypotheses concerning the fall-to-fall HS continuance, percent entering postsecondary institutions, and percent entering 4-year colleges. Each resulting model contained the three student input aggregates and a measure of project size. Since these four variables are related to both project process variables and project outcome variables, they can be considered as control variables in each of the regression models designed to test specific hypotheses concerning the effect of UB program variables. The instructional practices and UB function variables attempt to measure various aspects of potential differences in the UB processes. The remaining project level variables are not considered as directly measuring these potentially important program components. (It is assumed that factors such as instructor or counselor experience would have only indirect effects operating through the UB program strategies that they chose to pursue.)

1. Instructional Practices

The first set of hypotheses to be tested through regression models concerns the null hypotheses that the three dimensions of instructional practices have no effect on fall-to-fall continuance, entry into PSE, or entry into a 4-year college, when controlling for the three student input variables and project size. The results of the three regression analyses are presented in Tables 8.16 to 8.18.

Referring to Tables 8.16 through 8.18, it can be seen that the instructional practice factors do not significantly contribute to any of the three regression models. Percent academic risk is a statistically significant predictor of overall postsecondary entrance rate, and project size is significant in predicting 4-year college entrance rate.[30] In each of the models, student input variables and project size account for most of the regression sum of squares. Fall-to-fall HS continuance is associated with the smallest total R^2, which could

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[30] Recall that the reported level of statistical significance is double that obtained assuming a simple random sample.

Table 8.16

POSTSECONDARY ENTRY RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, PROJECT SIZE, AND THREE INSTRUCTIONAL PRACTICE FACTORS

Source of Variation	Zero-order Correlation with Post-secondary Entrance Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level[a]
Percent Male	-.073	.0107	.6326	-.1272	NS
Percent Poor	.111	.0217		-.0338	NS
Percent Academic Risk	-.501	.4889		-.4330	.01
Project Size	.402	.1113		.2684	NS
Traditional Formal Methods	.157	.0000	.0097	-.0063	NS
Nontraditional Formal Methods	-.084	.0089		.0637	NS
Informal Methods	.038	.0008		.0211	NS
Total Regression	—	.6423		—	—
Total Corrected Variation	—	1.9782		—	—

NOTE: This analysis was performed for 52 projects and yielded a total R^2 of .3246.

[a] The significance level reported is double the significance obtained assuming a simple random sample.

Table 8.17

FALL-TO-FALL HS CONTINUANCE/COMPLETION RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, PROJECT SIZE, AND THREE INSTRUCTIONAL PRACTICE FACTORS

Source of Variation	Zero-Order Correlation with Fall-to-fall Continuance Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level[a]
Percent Male	.088	.0031	.0659	.0712	NS
Percent Poor	.072	.0026		.0308	NS
Percent Academic Risk	-.373	.0504		-.2650	NS
Project Size	.286	.0098		.1405	NS
Traditional Formal Methods	.060	.0001	.0150	.0037	NS
Nontraditional Formal Methods	-.284	.0149		.2026	NS
Informal Methods	-.084	.0000		-.0120	NS
Total Regression	--	.0809		--	--
Total Corrected Variation	--	.3925		--	--

NOTE: This analysis was performed for 52 projects and yielded a total R^2 of .2063.

[a] The significance level reported is double the significance obtained assuming a simple random sample.

Table 8.18

FOUR-YEAR COLLEGE ENROLLMENT RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, PROJECT SIZE, AND THREE INSTRUCTIONAL PRACTICE FACTORS

Source of Variation	Zero-Order Correlation With 4-Year College Entrance Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level[a]
Percent Male	.091	.0190	.7463	.0581	NS
Percent Poor	.097	.0256		-.0153	NS
Percent Academic Risk	-.393	.3220		-.2314	NS
Project Size	.524	.3797		.4401	.01
Traditional Formal Methods	.161	.0023	.0443	.0260	NS
Nontraditional Formal Methods	-.068	.0102		.0250	NS
Informal Methods	.121	.0318		.1260	NS
Total Regression	--	.7906		--	--
Total Corrected Variation	--	2.3037		--	--

NOTE: This analysis was performed for 52 projects and yielded a total R^2 of .3431.

[a] The significance level reported is double the significance obtained assuming a simple random sample.

be due in part to the smaller variation in fall-to-fall continuance/completion rates across projects relative to postsecondary entrance rates and 4-year college enrollment rates. The analyses indicate that instructional strategies as defined and measured in this study are not significantly related to any of the three outcome variables when controlling for student input and project size.[31] These findings should not be taken to mean that instructional strategies do not make a difference in UB outcomes. Rather they indicate that the instructional strategies measured in this study do not capture the variation that is predictive of the UB outcomes measured in this study. This could be due to inadequate measurement characteristics such as the unreliability of data, lack of sufficient variation among projects on these measures, or measurement of the wrong dimensions.

2. Functions Emphasized.

Project staff rank-ordered the emphasis of seven UB project functions for both the summer and academic year program. Three of these functions for both summer and academic year programs were hypothesized to impact on the three critical outcome variables. These functions are: tutoring/remedial instruction, counseling, and parental involvement. There are six measures in all; three for the summer program and three for the academic year program. The null hypotheses to be tested are that these six UB functions have no impact on the three outcomes when the three student input variables and project size are controlled. The results for the three sets of regression equations are presented in Tables 8.19 to 8.21.

PSE entry rate is the most predictable of the three outcome variables from the input, size, and function factors as shown in Table 8.19. The R^2 is .499 and the input and size variables contribute over two-thirds of this explained variance. The function variables do, however, add a significant increment to the regression sum of squares. The standardized partial regression coefficients for

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[31] The zero-order correlations of the three instructional practices factors with each of the three criteria suggest that they are not significantly related even without controlling for student input variables and project size.

Table 8.19

POSTSECONDARY ENTRY RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, *PROJECT SIZE*, AND SIX UB FUNCTIONAL EMPHASIS FACTORS

Source of Variation	Zero-Order Correlation With Post-secondary Entrance Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level a/
Percent Male	-.046	.0040	.6320	-.1638	NS
Percent Poor	.174	.0541		.0348	NS
Percent Academic Risk	-.496	.4242		-.2810	NS
Project Size	.455	.1496		.1458	NS
Tutoring/Remedial Instruction (Summer)	-.090	.0001	.3082	-.1389	NS
Tutoring/Remedial Instruction (Academic Year)	.451	.1255		.4493	.025
Counseling (Summer)	-.194	.0179		-.1093	NS
Counseling (Academic Year)	-.127	.0004		.0781	NS
Parental Involvement (Summer)	.292	.0263		.0311	NS
Parental Involvement (Academic Year)	.132	.1380		.3323	.05
Total Regression	--	.9400		--	--
Total Corrected Variation	--	1.3351		--	--

NOTE: This analysis was performed for 50 projects and yielded a total R^2 of .4987.

a/ The significance level reported is double the significance obtained assuming a simple random sample.

tutoring/remedial instruction during the academic year, and parental involvement during the academic year are statistically different from 0 at the .025 and .05 levels, respectively. Both coefficients are positive and indicate that higher emphasis on these two factors is associated with a higher PSE entry rate when other variables in the regression equation are held constant. The next largest R^2 (.433) is associated with prediction of 4-year college enrollment rate as shown in Table 8.20. Parental involvement during the academic year again shows a partial association which is significant at the .05 level, and tutoring/remedial instruction during the academic year exhibits the next largest regression coefficient (although it is not significant at the .05 level). Four-year college enrollment rate and overall PSE entry rate are correlated .74, and a similar pattern emerges regarding the partial associations of the two UB function variables to these related outcome variables.

The final regression analysis in this set involves regressing the fall-to-fall HS continuance/completion rate on the same set of independent variables. The results of the analysis are reported in Table 8.21. The R^2 of .285 is the smallest of the three analyses and no UB function variable showed statistically significant regression coefficients.

The significant findings that were observed in this subsection (Tables 8.19 and 8.20) do not necessarily indicate that emphasis on these project functions effects a higher level of the outcomes considered. It means that there is a partial association between the process factors and outcome measures. For example, it could be that success of the project could increase parental involvement or that parental involvement covaries with some other factor that causes projects to have higher PSE entry rates. Another reason why these findings should be viewed cautiously is that they are marginally significant. Since the data points are still few relative to the number of variables, some capitalization on random variation has likely occurred. These significant findings do, however, suggest areas toward which further research emphasis can be directed.

Table 8.20

FOUR-YEAR COLLEGE ENROLLMENT RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, PROJECT SIZE, AND SIX UB FUNCTIONAL EMPHASIS FACTORS

Source of Variation	Zero-Order Correlation With 4-Year College Entrance Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level[a]
Percent Male	.069	.0093	.6474	-.0167	NS
Percent Poor	.240	.1217		.0948	NS
Percent Academic Risk	-.416	.2552		-.2047	NS
Project Size	.512	.2612		.2753	NS
Tutoring/Remedial Instruction (Summer)	-.069	.0039	.2021	-.0649	NS
Tutoring/Remedial Instruction (Academic Year)	.357	.0312		.3401	NS
Counseling (Summer)	.049	.0150		.0980	NS
Counseling (Academic Year)	-.047	.0023		.0496	NS
Parental Involvement (Summer)	.283	.0133		-.0060	NS
Parental Involvement (Academic Year)	.182	.1364		.3240	.05
Total Regression	--	.8497		--	--
Total Corrected Variation	--	1.9605		--	--

NOTE: This analysis was performed for 50 projects and yielded a total R^2 of .4334.

[a] The significance level reported is double the significance obtained assuming a simple random sample.

Table 8.21

FALL-TO-FALL HS CONTINUANCE/COMPLETION RATE REGRESSED ON THREE PROJECT INPUT VARIABLES, PROJECT SIZE, AND SIX UB FUNCTIONAL EMPHASIS FACTORS

Source of Variation	Zero-Order Correlation With Fall-to-Fall HS Continuance/ Completion Rate	Regression Sum of Squares		Standardized Partial Regression Coefficients	Significance Level[a]
Percent Male	.110	.0046	.0680	.0800	NS
Percent Poor	.112	.0060		.0845	NS
Percent Academic Risk	-.366	.0437		-.3455	.05
Project Size	.318	.0137		.2225	NS
Tutoring/Remedial Instruction (Summer)	-.006	.0006	.0415	.1007	NS
Tutoring/Remedial Instruction (Academic Year)	-.013	.0209		-.2035	NS
Counseling (Summer)	.016	.0000		.0141	NS
Counseling (Academic Year)	.032	.0043		-.0597	NS
Parental Involvement (Summer)	.189	.0040		.0480	NS
Parental Involvement (Academic Year)	.280	.0117		.2144	NS
Total Regression	--	.1095		--	--
Total Corrected Variation	--	.3845		--	--

NOTE: This analysis was performed for 50 projects and yielded a total R^2 of .2849.

[a] The significance level reported is double the significance obtained assuming a simple random sample.

C. Post Hoc Regression Analyses

The results of the regression analyses presented in the two previous subsections, as well as results of the discriminant analyses presented in Section II, suggest that relationships existed between certain project process variables and student outcomes. Specific project variables that were hypothesized as being related to student outcomes were general activity level in the academic year program and parental involvement. A further investigation of these hypotheses thus appeared warranted; however, such an investigation is clearly conducted in the spirit of *a posteriori* analysis. That is, having decided on the set of process variables to be examined (by decision rules based on practical and theoretical consideration), certain relationships were uncovered and specific questions raised. The decision to further explore the uncovered relationships using other previously excluded process variables was, however, strictly guided by the relationship that had already been observed. Such investigations are clearly *post hoc*.

Item 20 of the PDQ, previously uninvestigated for a relationship to student outcomes, provides a measure of the activity level of the project during both the summer and the academic year programs. Directors were asked to indicate the existence at their project of 32 specific activities during summer and academic year programs. These 32 activities were grouped into nine major areas and a count of the number of activities offered in each major area constituted the measure of activity level for that area. The areas were: (1) remedial course offerings, (2) general academic course offerings, (3) enrichment course offerings, (4) minority-specific course offerings, (5) course offerings in specific skill development, (6) tutoring activities, (7) counseling and other helping activities in non-academic areas, (8) counseling and other helping activities in academic areas, and (9) other activities.[32/]

[32/] The general areas were defined as follows: *Remedial Courses*, subitems 2, 3, and 5; *General Academic Courses*, subitems 4, 6, 8, and 9; *Enrichment Courses*, subitems 10, 11, and 12; *Minority-Specific Courses*, subitems 7 and 15; *Specific Skill Courses*, subitems 13, 14, and 16; *Tutoring*, subitems 17, 18, 19, and 20; *Nonacademic Counseling and Help*, subitems 21, 22, and 29; *Academic Counseling and Help*, subitems 23, 24, 25, 26, 27, and 28; *Other Activities*, subitems 30, 31, 32, and 33. See Appendix D for specific subitem identification.

The resultant activity measures were examined for relationships with student outcomes, after controlling for project variation on a set of eight variables previously observed to exhibit relationships with student outcomes (the seven input variables considered in subsection III.A and project size). The control variables were forced into a regression model and the activity level variables were allowed to enter in a stepwise manner as long as any remained which were related sufficiently to the outcome measure to produce a partial F value of 1.5 or greater. Separate analyses were performed for summer measures and academic year measures.

Summaries of these analyses are presented in Tables 8.22 and 8.23 for the summer program and academic year program, respectively. These tables show the partial correlations of all variables in the final stepwise regression solution with the specific student outcome measure being considered. Also shown in the tables are: (1) the proportion of variance in the outcome measures accounted for by a regression model including only the control variables, and (2) the proportion of variance in the outcome measure accounted for by the final stepwise regression solution (including the eight control variables and any activity measure that may have entered the equation).

Although the analyses were conducted using different subsets of projects (due to the fact that some projects had different patterns of indeterminate data for summer and academic year measures), a comparison between the two tables is useful. The patterns of partial correlations of the control variables to a given student outcome measure are similar, regardless of whether academic year or summer program activity levels are included in the final stepwise solution. The control variables, as a set, are more predictive of some student outcomes than of others, and individual control variables are more or less uniquely predictive depending on the specific student outcome being considered. These results are in basic agreement with other regression analyses involving these variables, as reported in previous subsections.

For the basic outcome measures (HS continuance, change in academic GPA, change in academic course load, and PSE entry rate), the gain in prediction by addition of academic year activity level measures to the

Table 8.22

SUMMARY OF STEPWISE ANALYSES FOR REGRESSION OF STUDENT OUTCOMES ON MEASURES OF SUMMER PROGRAM ACTIVITY LEVEL IN SPECIFIC FUNCTIONAL AREAS

	Student Outcome Measures						
Predictor Variables	Fall-to-Fall HS Continuance	Change in Academic GPA	Change in Academic Course Load	Total PSE Entry Rate	Vocational/ Technical Entry Rate	2-Year College Entry Rate	4-Year College Entry Rate
Control Variables[a]							
Ninth Grade Academic GPA	.12	.08	.19	.27	-.07	.03	.06
Ninth Grade Academic Course Load	.06	-.16	-.64	.45	.20	-.02	.18
Proportion of 11th Graders	-.09	.01	-.02	-.34	-.08	.04	-.07
Proportion of 12th graders	-.01	.23	.21	-.21	.16	.02	-.21
Proportion Male	.14	-.01	.22	.04	-.34	.16	.24
Proportion Poor	.18	.28	-.34	-.06	-.17	-.04	.18
Proportion Academic Risk	-.01	-.07	-.05	.13	.06	-.10	.07
Project Size	.13	-.54	.00	.40	.02	-.20	.29
Functional Area[b]							
Remedial Courses					-.22	-.31	
General Academic Courses		-.32		-.34			
Enrichment Courses		.39				-.23	
Minority Specific Courses					-.45	.37	
Skill Improvement Courses			-.32				
Tutoring							
Counseling and Other Help (Nonacademic)							
Counseling and Other Help (Academic)	-.22				.38		
Other Activities			.30				
Proportion of variance in dependent variable accounted for by a model including only the control variables	.218	.418	.472	.477	.163	.076	.267
Proportion of variance in dependent variable accounted for by the final stepwise regression model	.254	.530	.573	.536	.380	.259	.267

NOTE: These analyses were conducted using the 45 projects for which determinate data were available on all variables considered. Given in the table are the partial correlations of each predictor variable, which was entered in the final stepwise solution, with the student outcome measures.

[a] These variables were forced into the regression equation prior to examining any contribution to regression by the activity levels in the functional areas.

[b] These measures were computed from responses to item 22 of the PDQ and reflect the number of specific activities offered by the project in each of the listed general areas.

Table 8.23

SUMMARY OF STEPWISE ANALYSES FOR REGRESSION OF STUDENT OUTCOMES ON MEASURES OF ACADEMIC YEAR PROGRAM ACTIVITY LEVEL IN SPECIFIC FUNCTIONAL AREAS

	Student Outcome Measures						
Predictor Variables	Fall-to-Fall HS Continuance	Change in Academic GPA	Change in Academic Course Load	Total PSE Entry Rate	Vocational/ Technical Entry Rate	2-Year College Entry Rate	4-Year College Entry Rate
Control Variables[a/]							
Ninth Grade Academic GPA	.07	-.26	.19	.32	-.05	.03	.01
Ninth Grade Academic Course Load	.13	.15	-.66	.44	.18	-.07	.19
Proportion of 11th Graders	-.05	.16	.06	-.41	-.18	.15	-.05
Proportion of 12th graders	-.06	.48	.24	-.21	-.24	.21	-.11
Proportion Male	.10	-.24	.27	.12	-.18	-.04	.31
Proportion Poor	.17	.18	-.35	.11	.08	-.11	.16
Proportion Academic Risk	.02	-.21	-.01	.16	-.06	-.02	.06
Project Size	.18	-.38	00	.13	-.32	-.10	.43
Functional Area[b/]							
Remedial Courses		.28		.32			
General Academic Courses		-.55					
Enrichment Courses	.21	.39		.22			
Minority Specific Courses			-.26				
Skill Improvement Courses		.44		.24			
Tutoring							.29
Counseling and Other Help (Nonacademic)							-.21
Counseling and Other Help (Academic)	-.25	-.32					
Other Activities			.22				
Proportion of variance in dependent variable accounted for by a model including only the control variable	.206	.407	.479	.464	.225	.074	.267
Proportion of variance in dependent variable accounted for by the final stepwise regression model	.288	.661	.526	.622	.225	.074	.331

NOTE: These analyses were conducted using the 46 projects for which determinate data were available on all variables considered. Given in the table are the partial correlations of each predictor variable, which was entered in the final stepwise solution, with the student outcome measures.

[a/] These variables were forced into the regression equation prior to examining any contribution to regression by the activity levels in the functional areas.

[b/] These measures were computed from responses to item 22 of the PDQ and reflect the number of specific activities offered by the project in each of the listed general areas.

regression model is generally greater than for summer activity measures. Relatedly, more of the academic year measures enter into the final stepwise solutions. For those student outcomes pertaining to pattern of PSE placement, the picture is somewhat different. Academic year activity level variables marginally increase predictability of 4-year college placement, while summer activity level variables substantially increase predictability of vocational/technical school and 2-year college placement.

The results of these analyses do not provide a consistent or stable picture of relationships between program activity level in specific areas and the student outcomes. Some regression models are quite reasonable, while others are much less reasonable. As an example, consider the results for PSE entry rate. The stepwise solution for the academic year activity yields an increase of 16 percentage points in predictable variance of PSE entry over that accounted for by the control variables. Moreover, the partial relationships between the activity level measures and PSE entry rate are positive and reasonable. Holding input and project size constant, greater levels of academic year activity in the areas of remedial course work, enrichment courses, and specific skill development courses are related to higher PSE entry rates. On the other hand, the addition of summer activity measures raises the predictable proportion of variance in PSE entry by only about 6 percent. The one activity level measure included in the stepwise solution is general academic course offering and the sign of the partial correlation is negative. This suggests that greater levels of summer program activity in the area of general academic courses is related to lower levels of PSE entry, controlling for project input and size differences.

It should be recalled that stepwise methods are quite subject to chance data fluctuations and that these analyses were post hoc analyses. Also, as previously indicated, the entry of these measures into the multiple regression model was facilitated by an extremely generous inclusion rule criterion. In general, however, these analyses do lend support to the hypothesis that academic year level is positively related to the basic student outcomes.

Two items of the PDQ provided data allowing a further investigation of the hypothesized relationship between parental and community involvement and student outcomes. Item 25 of the questionnaire solicited the directors' evaluation of the effectiveness of activities performed by parents and community groups; item 27 requested ratings of the support which the project received from parents as well as from other groups and agencies. Stepwise regression analyses were performed for each questionnaire item separately and the results of these analyses for each of the student outcome measures are summarized in Tables 8.24 and 8.25. These analyses were performed in a manner analogous to that described for the previous analyses of activity level measures, and the tables present the same type of summary information.

From Table 8.24 it can be seen that the rated effectiveness of functions performed by parents and community groups entered the stepwise solutions for only five of the student outcome measures. Increase of explained variance in the student outcomes by including the function-effectiveness measures was not substantial except for 4-year college placement, and in that case the signs of the partial correlations lead to some confusion in reasonable interpretation. The results presented in Table 8.25 indicate that the level of support from students' families is not related to any of the student outcome measures when controlling for project input and size. The post hoc analyses do not, therefore, support the hypothesis that parental involvement is related to student outcomes.

IV. SUMMARY

The purpose of this chapter was an exploration of possible relationships of project characteristics and project outcomes. The approach used reflects an hypothesis-generating philosophy--examining the available sample data for patterns of relationships and using obtained results to generate hypotheses that may be subject to test in later studies. Three sets of variables were available for analysis. They were preprocess measures (e.g., student grades, student poverty status), process measures (e.g., staff characteristics, project functions, type of project instruction), and outcome measures (e.g., PSE entry rate, change in GPA, type of PSE entered). Variables within each class were aggregated over students or staff members,

Table 8.24

SUMMARY OF STEPWISE ANALYSES FOR REGRESSION OF STUDENT OUTCOMES ON EFFECTIVENESS OF FUNCTIONS PERFORMED BY PARENTS AND COMMUNITY GROUPS

	Student Outcome Measures						
Predictor Variables	Fall-to-Fall HS Continuance	Change in Academic GPA	Change in Academic Course Load	Total PSE Entry Rate	Vocational/ Technical Entry Rate	2-Year College Entry Rate	4-Year College Entry Rate
Control Variables[a/]							
Project Size	.10	.53	-.14	.30	-.32	[illegible]	.52
Ninth Grade Academic GPA	.11	-.26	.31	.20	-.05	[illegible]	.18
Ninth Grade Academic Course Load	.05	.13	-.69	.43	.18	[illegible]	.15
Percent of 11th Graders	-.09	.18	-.04	-.34	-.17	.19	-.09
Percent of 12th graders	-.09	.27	.32	-.25	-.24	.19	-.06
Percent Male	.18	-.01	.25	-.05	-.18	-.05	.34
Percent Poor	.21	.34	-.40	.07	.09	.14	.27
Percent Academic Risk	-.04	-.21	.03	.06	-.07	-.14	.29
Functions Performed[b/]							
Identifying Eligible Participants	.29						
Identifying Potential Staff		.23	-.22				.32
Assistance with Basic Project Proposal			.30				
Securing Additional Funds							
Liaison with Other Agencies						.30	-.46
Direct Volunteer Services							
Suggestions for Program Improvement							
Proportion of variance in student outcome explained by a regression model containing only the control variables	.210	.407	.524	.465	.228	.063	.275
Proportion of variance in student outcome explained by the final stepwise regression model	.275	.439	.569	.465	.228	.147	.438

NOTE: These analyses were performed using the 45 projects which provided determinate data for all variables considered. Given in the table are the partial correlations of each predictor variable, which was entered in the final stepwise solution, with the student outcome measures.

[a/] These variables were forced into the regression equation prior to examining any contribution to regression by the activity levels in the functional areas.

[b/] These measures were computed from responses to item 22 of the PDQ and reflect the number of specific activities offered by the project in each of the listed general areas.

Table 8.25

SUMMARY OF STEPWISE ANALYSES FOR REGRESSION OF STUDENT OUTCOMES ON SUPPORT RECEIVED FROM VARIOUS GROUPS AND AGENCIES

Predictor Variables	Student Outcome Measures						
	Fall-to-Fall HS Continuance	Change in Academic GPA	Change in Academic Course Load	Total PSE Entry Rate	Vocational/ Technical Entry Rate	2-Year College Entry Rate	4-Year College Entry Rate
Control Variables[a]							
Project Size	.15	-.54	.02	.33	-.29	-.12	.44
Ninth Grade Academic GPA	.18	-.30	.33	.24	-.02	.03	.18
Ninth Grade Academic Course Load	.12	.08	-.65	.52	.18	-.03	.15
Proportion of 11th Graders	-.11	.16	-.09	-.28	-.19	.19	-.09
Proportion of 12th Graders	-.09	.32	.28	-.34	-.27	.16	.08
Proportion Male	.12	.23	.15	-.01	-.21	-.01	.18
Proportion Poor	.11	.38	-.34	.05	.06	-.12	.12
Proportion Academic Risk	.03	-.28	.11	.13	-.06	-.03	.18
Groups From Which Support Received							
UB Students				-.27			
UB Students' Families							
The Local Community							
The Host Institution							
The Feeder HSs	-.24				-.26		
The USOE Regional Office							
The USOE National Office			-.25				-.25
Proportion of variance in student outcome explained by a regression model containing only the control variable	.217	.497	.520	.492	.256	.073	.283
Proportion of variance in student outcome explained by the final stepwise regression equation	.262	.497	.550	.530	.308	.073	.327

NOTE: These analyses were conducted on responses to item 27 of the PDQ for the 43 projects for which determinate data were available for the variable considered. Given in the table are the partial correlations of each predictor variable, which was entered in the final stepwise solution, with the student outcome measures.

[a] These variables were forced into the regression equation prior to examining any contribution to regression by the activity levels in the functional areas.

as appropriate, to produce project level units of analysis. Many of the resulting aggregated process measures were reduced to composite indices through a priori scale construction or factor analysis. The resulting data base produced a set of 54 observations. Several approaches were taken to uncover possible relationships among the three basic sets of variables (input, process, and output), using the statistical methods of multiple discriminant analysis and multiple regression analysis.

The stepwise discriminant analyses followed two distinct but similar paths in attempting to establish relationships among the classes of variables. In the first approach, projects were grouped according to structural and functional classifications (as defined by the sampling frame for the study) and these groups were examined for differences in student input and outcome measures. In the second approach, projects were empirically clustered in terms of student outcome measures, and the resultant groups were examined for differences in process and student input measures. The regression analyses considered the outcome measures individually and examined the relationships between each measured output and subsets of process and input variables. Stepwise analyses as well as analyses testing rational a priori models were performed.

It should be reemphasized that the analyses described in this chapter are exploratory and indicate, at best, relational information. Assumptions of causality are in no way warranted. Moreover, the use of stepwise methods allows considerable margin for error through strictly data-dependent relationships. Thus, any results of the stepwise procedures should be cross-validated to determine if, in fact, a stable relationship exists. Further, it should be kept in mind that these analyses in no way attempt to evaluate the absolute effectiveness of the UB program, such evaluative analyses having been presented in Chapter 7. Rather, the focus of the chapter has been an attempt to identify those programmatic characteristics that allow one project to better accomplish program objectives than others, while controlling for differences in students served.

The results of the various analyses resist a precise interpretation, but one general theme is reflected in the majority of analyses. Project *level outcomes as measured in this study show relatively consistent relationships to the measured input characteristics of the students in the project; however, they show, at best, weak relationships to project process measures when adjustments for the student input measure differences are made.*

The relationships between student outcomes and preprocess characteristics of the students are fairly intuitive and offer little useful information to UB program planners. The fact that a greater proportion of students are placed in 4-year educational institutions by projects with proportionately fewer academic risk students is certainly not a surprising finding. Any project can determine the preprocess characteristics of its participants through its selection criteria (for which some latitude exists).

The one small hint of a relationship between process and output comes from the frequent occurrence of project size and emphasis of various academic year program functions in the various regression and discriminant models, and the notable absence, in such models, of measures of emphasis of summer program functions. Project size may partially reflect activity level of the academic year program, since the measure represents the number of students enrolled in the project in the fall of 1973. *Post hoc* regression analyses, conducted to further investigate this possibility, provided some small additional support of the major analysis findings. The total pattern of findings is suggestive of a positive relationship between level of academic year program activity and student outcomes, but there are other plausible explanations of this pattern.

The failure to uncover any systematic or consistent set of process variables which lead to greater success of some projects is disturbing and counterintuitive, particularly in light of the latitude allowed in these analyses. Clearly, projects differ in terms of degree of success as seen in the variability of student outputs over projects. When input differences of students served by the projects are controlled, however, none of the measures of project process show consistent relationships to the output measures. It may be that no relationship between process and outcome measures exist, although such an interpretation is illogical. On the other hand, the lack of observed relationship could be attributed to many other causes: measurement error, inappropriate choice of variables, or inappropriate analysis models, to name but a few. One reasonable explanation is that measurement error and relatively pervasive relationships between input and output jointly mask any existing relationships between process and output. If this is the case, then either the relationships are relatively weak or the measurement error is large, or both.

Another possible explanation of this negative finding is suggested by site visit observations. Project philosophy and goals differ considerably from one project to another, within the limits defined by the legislation. Moreover, differing philosophies and goals to lead to emphasis of different project intervention strategies, to selection of different foci as to the appropriate target student, and to different emphases on the degree to which different student outcomes should be maximized. Both the program implementation and the type of student to be served will be influenced by this basic philosophy, and, to the extent that the project is successful in attaining its goals, it should be measured as "more successful" in terms of the output measures on which it has concentrated and "less successful" for those output measures toward which it has devoted little attention.

If this is the case, and visits to 15 of the UB projects do suggest it as a strong possibility, then there are two implications for this study or future ones. First, this possibility implies that input measures and process measures are confounded. That is, different processes are used because of the fact that different types of students are selected, and different students are selected because a program has geared its process to that particular type of student. With this type of confounding, statistical adjustments for input differences, such as those used in this chapter, would tend to wash out any effects due to process.

The second implication is that lacking unitary purposes among projects (even though the purposes of the program are generally stated in the legislation and guidelines governing program operation), the effectiveness of a given project, relative to other projects, should be judged on the basis of outcomes toward which that project is striving. Given the particular aim of a project, some outcomes will be emphasized more than others (and probably at the expense of others). If one accepts this hypothesis, then the results of the empirical clustering of projects on these three outcome measures is quite reasonable. Only one group of projects was consistently below average on all three outcome measures, and only one cluster exhibited a strictly above-average profile. The remaining clusters showed, in general, very high relative effectiveness on some outcome measures but very low relative effectiveness on others.

This explanation is quite consistent with the pattern of findings reported in this chapter. To investigate these hypotheses more fully, however, would require different approaches to both design and measurement than those employed in this study.

Chapter 9

Summary and Conclusions

I. PURPOSE, DESIGN, AND METHODOLOGY

A. Purpose

Under authority of the Economic Opportunity Act of 1964, as amended (42 U.S.C. 2809), the Office of Economic Opportunity (OEO) funded 17 Upward Bound (UB) projects as a pilot program in the summer of 1965. In 1966, UB was authorized as a national program under Title II-A of the Economic Opportunity Act. On July 1, 1969, responsibility for the program was transferred from OEO to the U.S. Office of Education (USOE), Department of Health, Education, and Welfare (HEW). Currently, UB is authorized under section 408 of the Higher Education Act of 1965, as amended (20 U.S.C. 1068). The purpose of UB is to prepare and motivate high school (HS) students to succeed in secondary and postsecondary education. The program is targeted for low-income youths who have potential for education in and beyond HS but who lack motivation and/or adequate HS preparation, and are thus unlikely to achieve a postsecondary education (PSE) without assistance.

In July 1973, USOE awarded the Research Triangle Institute (RTI) a contract (number OEC-0-73-7052) to plan and conduct an evaluation of the UB and Talent Search (TS) programs. RTI carried out the planning study during the period of June 1973-January 1974; the actual studies were implemented and conducted from February 1974 to March 1976. (The results of the TS study are reported in Volume III of this report.)

The legislatively mandated objective of the UB program is the generation of the skills and motivation necessary for success in education beyond HS. The primary goal of the RTI study of the program was to evaluate the accomplishment of two of the program's objectives related to the legislative mandate: (1) to increase the HS retention rate of its participants, and (2) to increase the rate of entry of its participants into institutions of PSE. Evaluation of attainment of actual skills and motivation was a secondary goal of the study, primarily because of practical problems involved in determining and measuring the nature and degree of such skills and motivation. The current study was, however, designed to provide the basis for a limited longitudinal study whereby this third objective could be more fully investigated. Another secondary study goal was to provide a detailed description of the UB program as it existed during the 1973-74 program year, including characteristics of the staff and students, their perceptions of the program, and project operations and costs.

Given these study goals, the study focused on the 333 regular UB projects operating in the coterminous United States during the 1973-74 program year. The 83 projects operating outside the coterminous United States and/or classified as special Veterans or demonstration projects were excluded. The conclusions presented in this chapter are based on the body of evidence obtained from the study of these projects.

B. General Design

Several sources were consulted in designing the study, including the enabling legislation, the official guidelines, and the relevant research literature (in particular, the Greenleigh Associates report of 1970 and the GAO report of March 1974). Heavy use in the design phase was also made of selected program personnel, current and former UB staff personnel and students, and three study advisory councils or panels. Taking into consideration input from these sources and certain study constraints, the UB evaluation utilized a quasi-experimental design in which a sample of UB students and a sample of comparison students were studied through a short period of time.

The resulting design was basically cross-sectional, with the collection of some retrospective and short-range longitudinal data. A synthetic cohort approach was incorporated, making it possible to estimate the transition of UB and comparison students from tenth grade entry into postsecondary education. Although the adopted design was limited, it was capable of evaluating study objectives within the time limit requested by USOE; it required relatively small samples and was thus less costly; and it had potential for expansion into a longitudinal study.

C. Sampling Procedures

To satisfy the study objectives and to obtain results that would contain a minimum of bias, data were collected from many sources and from a broad spectrum of persons. Multistage probability sampling techniques, which allow unbiased estimates from the sample data, were employed to select the necessary samples of projects, project staff, HSs, and students.

In the first sampling stage, 54 of the 333 eligible UB projects were selected after stratification on such characteristics as ethnicity of the majority of students, number of students served, project location, project emphasis, and type of host institution. As a second step, all UB participants in each sampled project who were in grades 10, 11, or 12 in September or October 1973 were selected into the UB student sample. The final sample contained 3,710 UB students.

Comparison students were defined as students in the same grade levels and HSs as the UB students, and who were similar to UB students in ethnicity, low income status, and academic risk status. For each UB project selected into the sample, one or more HSs providing students to that project were selected (averaging two per project). Using data obtained from teachers of sampled classrooms in each of these HSs, a total of 2,340 comparison students (about 21 per sampled HS) were selected on the basis of grade level, ethnicity, low income status, and academic risk status.

In each sampled UB project, the project director and a sample of counselors and instructors were selected for the questionnaire survey. In general, six staff members per project were chosen, with proportional representation of counselors and instructors. The final sample of UB project staff included 54 project directors, 104 counselors, and 211 instructors.

Finally, 15 of the 54 sampled UB projects were subsampled for site visitation. This sample of 15 projects was selected to include at least one project from each of 10 USOE regions, and to be representative of the population of UB projects with respect to the ethnic composition and residence of participants. Three of the 15 projects were also selected because they had strong academic programs which functioned during the school year as well as during the summer. Five of the 15 projects, including the three projects with strong academic and summer programs, were designated to receive two site visits--one during the academic year and one during the summer.

D. Instrumentation and Data Collection

A total of 11 instruments (several of which were available in slightly different forms) were used in collecting data through questionnaire responses, interview responses, and student records. Three of these instruments were questionnaires used to obtain information directly from students; four were forms which provided information about students and were completed by HS teachers, RTI study administrators, or UB project staff members; three were UB project staff questionnaires that were mailed to UB project directors, project counselors, and project instructors; and the remaining form was a site-visit protocol.

One of the instruments completed by students, the Basic Student Questionnaire (BSQ), was administered in the spring of 1974 by RTI study administrators to the sample of UB and comparison students who were available at the HSs or projects. A special student Dropout/Transfer Questionnaire (D/TQ) was mailed to those UB and comparison students who were not available for the spring administrations of the BSQ (e.g., UB students who left the program and/or HS, comparison students who left HS, or UB students who were otherwise absent from the test administrations). The third student questionnaire, the Fall Status Questionnaire (FSQ) administered in the fall of 1974, was used both as a mail survey instrument and as a telephone survey instrument.

One of the four forms used to collect information about students was the HS Classroom Roster (HSCR) that was mailed to and completed by homeroom teachers for the comparison students in the sample. The second was the Student Transcript Form (STF), used by RTI study administrators to gather academic record information on UB and comparison students. The third was the Survey Administrator Roster Form (SARF), used by RTI study administrators to record reasons for absence of students from the administrations of the BSQ. The fourth was the Project Roster Verification Form (PRVF), mailed to directors of each of the sample UB projects, who completed it by verifying a list of UB students reported to have been in that project in the fall of 1973 and by specifying the grade level for each verified participant.

Return rates for these questionnaires were in most instances acceptable. Very low return rates were experienced, however, with the D/TQ. These questionnaires were mailed (without extensive followup) to those students who had left the HS or project, or who had previously failed to respond to the BSQ, and who were, as a result, difficult to locate and probably less motivated to respond. Approximately 85 percent of the UB and CS groups completed the BSQ administered in spring 1974, and approximately 80 percent of both groups responded to the FSQ (either by mail or telephone). Some questionnaire data were collected for 99.8 percent of the UB group and 98.3 percent of the CS group.

The three staff questionnaires were mailed in the spring of 1974 to the sample of project directors, counselors, and instructors. The return rates for these staff questionnaires were generally acceptable; 89.9 percent for project directors, 80.8 percent for counselors, and 72.9 percent for instructors. Complete staff data (i.e., questionnaires returned by all sampled staff in a project) were available for only about one-third of the projects sampled. For about 70 percent of the projects, questionnaires were available for the project director and for at least half of the counselors and instructors who were sampled.

The site-visit protocol provided the overall guidelines for each site visit, including the list of major topics and related questions to be pursued in the 183 interviews conducted with project directors, project staff, students, and other persons associated with projects and host institutions. Based on the impressions gained through these unstructured interviews and observations of project activities, a report was prepared for each of the 15 visited sites.

E. Data Quality

The generally satisfactory response rates do not, by themselves, give an accurate picture of the extent of missing data for specific questionnaire items, or of the quality of the available data. Consequently, extensive checks for missing data, out-of-range data, multiple responses, and inconsistent responses (including skip pattern inconsistencies, inconsistencies within instruments, and inconsistencies between instruments) were performed.

When feasible, logical and stochastic imputation techniques were used to rectify some problems of data quality.

Multiple and out-of-range responses within each questionnaire were infrequent. Item nonresponse within questionnaires occurred at a considerably greater rate; however, such nonresponse was concentrated within a few items and individuals. There was no serious problem of differential data availability between the UB and comparison students or among projects. In all, the extent of unavailable data had no serious impact on the analysis.

Inconsistent responses raised some serious questions regarding data quality. The major inconsistency problems within instruments arose from questionnaire items that were nested within complex skip patterns. Consequently, these items were used sparingly in the analysis. In only a few isolated cases was the incidence of logically inconsistent responses within specific questionnaires sufficiently large to pose serious analysis problems, and in such cases the data item was not analyzed. A matter of greater concern was the number of inconsistencies observed between the responses from two different sources of data (posing questions as to source credibility). Such inconsistencies were unexpected in light of the relatively objective nature (e.g., grade in HS, entry into PSE) of the responses being compared. For some data elements, inconsistency rates approached a high of 25 percent. The overall picture of intersource inconsistency was somewhat brighter for the major set of student variables considered (a maximum inconsistency rate of 4 percent for the 22 major variables).

A final problem related to data quality was the nonrepresentativeness of the data from the various respondent subgroups. While the direct analysis implications of the subgroup differences cannot be directly stated, there is strong indication of possible bias in results obtained for specific questionnaire respondent groups. Fortunately, differences between subgroups of respondents within the UB group were quite similar to those in the CS group. This suggests, but does not guarantee, that comparisons between the groups should be relatively free of bias, even when these comparisons are being made within a particular responding subgroup (such as respondents to the BSQ).

F. Analysis

In addition to routine analysis of data quality, three major classes of analyses were conducted: (1) student-oriented analyses, (2) program-oriented analyses, and (3) project-by-student analyses. Every effort was made in these analyses to avoid misinterpretations from spurious results. Sampling weights were used where feasible in computing the various statistics to provide unbiased estimates of population parameters. Weight adjustments were made for both item and instrument nonresponse.

The first class of analyses addresses questions of the effectiveness of the UB program with a primary focus on differences between UB participants and nonparticipants. Although the sample design effectively minimized differences between the UB and CS groups on certain input-related factors, a statistical procedure was used to effect an *a posteriori* equalization of the two groups.

The thrust of the program-oriented analyses is descriptive and either the project, specific project personnel, or subgroups of UB participants served as the units of analysis. The project-by-student analyses investigated relationships between a set of variables reflecting output measures and sets of student input and project process measures. For these analyses, concern shifts from national program effectiveness to an evaluation of differential program operations and the relative value of particular approaches to UB objectives.

II. SUMMARY AND INTERPRETATION OF MAJOR FINDINGS: CHARACTERISTICS OF UB PROJECTS, STAFF, AND STUDENTS

A major finding of the study, supported by the impressions gained by the site visitations and the analyses of the various questionnaire responses, is that UB does not appear to represent a single intervention treatment, or even two or three clearly delineated treatments. It is not easy to describe a typical project except in the most general terms. Variation, rather than commonality, was the salient aspect of program description for most of the dimensions considered. Within the general limits established by program guidelines, projects varied extensively in terms of the students served and the way in which specific intervention strategies were implemented. Pursuit of the general objectives of the UB program appeared to be common across projects, but particular programmatic emphases and assumptions relative to the attainment of the general objectives showed considerable variation among projects.

A. Project Costs

The analysis of the sources and uses of funds provided a descriptive profile of the financial characteristics of the UB projects. The weighted estimate of average total cost per project (excluding in-kind contributions) was $111,986 for the 1973-74 program year. For the 1973 summer program, the estimated cost was $63,769 per project or approximately $830 per student served; for the 1973-74 academic year program, the estimated average cost was $51,863 or approximately $700 per student served. Over 90 percent of these monies were contributed by federal sources. Projects reported receiving an average of $9,149 worth of in-kind contributions, such as office space, facilities, and personnel services, although these estimates may be low.

For the summer program, personnel costs accounted for about 45 percent of the sum of all reported component costs, other direct costs accounted for 50 percent, and indirect costs accounted for the remaining 5 percent. Analogous costs for the academic year program were 50 percent, 45 percent, and 5 percent, respectively. Thus, wages and salaries constituted the largest single expense, followed by payment for student room and board (26 percent of summer program costs and 12 percent of academic year program costs), and for student stipends (6 percent of summer program costs and 14 percent of academic year program costs).

Considerable variability was observed in the reported project cost figures. The range of reported total costs, excluding in-kind contributions, was from $9,792 to $175,000 during the summer program and from $19,500 to $134,000 during the academic year. Nonfederal support ranged from $0 to well over $100,000, with the preponderance of projects reporting no nonfederal funding.

Examinations of associations between project costs and certain project characteristics uncovered only a trivial relationship; the number of students served was found to be positively associated with total project costs. This relationship was observed for the total program year, and within summer and academic year components. When numbers of students served is controlled, no significant differences in project costs were found between projects housed at public vs. private institutions, or projects in rural, small urban, or large city locations. These results are not surprising since project funding is determined by a formula which accounts for number of students to be served.

In summary: the average federal cost per student for the summer program was about $830 in 1973-74, and for the academic year program about $700. The project directors estimated that less than 10 percent of program costs come from nonfederal sources, either cash or in-kind contributions; the programs thus depend heavily on federal funding. About half of the project funds are used to support staffing costs, and from one-fourth to one-third of the funds are used for student room, board, and stipends. Variability of total costs among programs was found to exist, of course, but appeared to be principally a function of the number of students served, and not of such factors as host institution characteristics or urban-rural origin of students. Thus, federal costs appear not to have escalated sharply since 1969, if the Greenleigh survey figure of annual per student cost in that year of $1,331 can be accepted as comparably derived; and, no factors were observed that would suggest institutional or urban-rural inequities in funding.

B. Project Staffing

On the average, the sampled projects were staffed by one and one-half full-time equivalent (FTE) administrative employees during both the academic year and summer programs. The average number of FTE support personnel was slightly greater in the summer (3.7) than in the academic year (2.4). The major staffing difference between the two program components was found in the area of service delivery (e.g., instructors and counselors). Projects were staffed, on the average, by 4.3 FTE service delivery employees during the academic year but this number increased to 11.5 during the summer program. There was considerable variation about these average staffing profiles, but no significant associations were found to exist between project staffing patterns and other project characteristics.

Most staff members were young (age 35 or less), although project directors as a group were slightly older than the instructors and counselors. Nearly all project directors, and over half of the instructors and counselors, were male. The greatest proportion of project directors were black (47 percent), while the greatest proportion of instructors and counselors were white (55 and 42 percent, respectively). Also represented among UB staff were American Indians, Mexican Americans, Puerto Ricans, and Orientals. These four categories in combination accounted for 19, 11, and 24 percent of the directors, instructors, and counselors, respectively. Based on site visitation data, projects appeared to employ staff of the same ethnicity as that of the student participants, though not always in the same representative proportions. Staff members tended to come most frequently from families where the fathers were laborers or service workers (50 percent of the directors and nearly 40 percent of the counselors and instructors), although the fathers of from 15 to 20 percent were reported as professionals.

Most staff personnel had obtained at least a bachelor's degree, with slightly more than half having obtained a degree at the master's level or higher. Over a third of the staff reported participation in continuing education at the time they completed their questionnaires. In addition, the majority of project directors and counselors, and approximately 40 percent of the project instructors, had attended some type of training institute which offered special training in teaching, counseling, or program administration for "disadvantaged" students. For the most part, the course work and training completed by the UB project staff appeared directly related to their job needs.

In addition to their formal training and education, UB project staff generally had a good deal of practical experience in their field of work, and to a lesser extent, working specifically with disadvantaged students (although for the most part this experience had been gained in working with the TRIO Programs). Most project directors reported several years of experience working with disadvantaged students in either an administrative or some other capacity, or both. Over 80 percent of the instructors reported at least 1 year of full-time teaching experience, while 60 percent reported having 5 or more years of teaching experience. Counselors as a group reported somewhat less experience in their field than did the instructors.

There appeared to be a fairly high turnover of instructional staff, reflecting a policy of replacing one-third of the instructors each year. The turnover suggested by the program guidelines is intended to expose larger numbers of HS teachers to the UB program. Turnover may also serve a screening function; or, it could reflect the uncertainties in year-to-year funding with confirmation of funding coming generally just before new programs must begin. In any case, given the short period of time that many projects have been in operation, and the apparent fact that on-the-job experience is the most frequent source of highly relevant training, it would appear that special training programs could be most valuable, and could also facilitate the development of a professionalism and commitment to the special compensatory and motivating challenges these staff face.

In summary: projects appear to be adequately staffed, with individuals of acceptable levels of formal training and experience for their positions. Staff turnover, and the fact that the majority of specifically relevant experience is gained from participating in the program, may suggest that special additional training would be desirable.

C. Staff Duties and Work Loads

Staff members spent the largest percent of their working time as would be expected; that is, the greatest proportion of the director's, instructor's, and counselor's time was spent on general administration, teaching, and counseling, respectively. However, all staff members performed a number of activities in common, principally, teaching and counseling. Some few staff members reported that their time was distributed among specified activities in a manner which was very discrepant from an ideal allocation of time. There was, however, no consistent trend in any of the three staff groups to report that more or less than an ideal amount of time was being allocated to any specific activity.

During the summer program, full-time instructors taught an average of 2.9 classes, while part-time instructors averaged a slightly lower workload of 2.4 classes, but the distribution of teaching load reflected considerable diversity. Almost 13 percent of full-time summer instructors were teaching one class or less during the summer, while over 18 percent of the part-time instructors were teaching four or more classes during the same period.

In performing their teaching functions, instructors reported extensive use of individualized instruction. Other common practices reported as used extensively by at least a third of the instructors included seminars or class discussions, open classrooms, and nongraded classes. In contrast, there was little reported use of competitive and noncompetitive grading systems, team teaching, or ability grouping.

During the summer program, the median number of students counseled per week in individual or group sessions was the same (about 16.5) for both full- and part-time counselors. During the academic year, the median numbers of weekly individual counseling sessions (and the median number of students counseled) for full- and part-time counselors, respectively, were 10.1 and 6.3. Full- and part-time counselors served a weekly average of 22.9 and 3.8 students, respectively, in group sessions during the academic year. The median lengths of individual counseling sessions both during the summer and academic year was about 30 minutes for full-time counselors, and about 22 minutes for part-time counselors. Median group session lengths were about 40 minutes in both summer and academic year programs for full-time counselors and about 26 minutes for part-time counselors. Most full- and part-time counselors reported that each student attended a total of two to four counseling sessions during the summer and academic year programs. Major concerns expressed by students during these counseling sessions were with entry into 4-year colleges, personal and family problems, social and situational problems, high school academic problems, and finances.

In summary: most staff members appear to be carrying reasonable work loads, and to be directing their energies efficiently toward their UB project duties. Administrators, instructors, and counselors perform many functions or activities in common. Instruction tends to be oriented toward group discussion or individualized instruction, and competition is deemphasized. The work load seems to be equally spread over full-time and part-time staff members. Full-time instructors teach only slightly more classes than part-time instructors, on the average. Part-time and full-time counselors carry the same number of students in the summer but part-time counselors serve fewer students in the academic year than do full-time counselors, particularly in group as opposed to individual sessions. Part-time counselors spend slightly less time with their counselees than do full-time counselors.

D. Recruitment and Characteristics of Students

UB students reported first hearing about the program from a variety of sources, the most frequent of which was other UB students (30 percent). Other sources mentioned by over 5 percent of the students were school guidance counselors, UB staff members, and school teachers. These results support the site visit observations that formal student recruitment was carried out in most projects by "contact counselors" or other personnel employed not by UB but by the feeder high schools. UB project directors and staff assumed responsibility for the final selection of students (using various criteria but generally considering factors such as student poverty status, student grades and aptitude test scores; teacher and counselor recommendations, evidences of student motivation, and personal intuition).

Many ethnic groups were represented by UB students in the 1973-74 program year: approximately 61 percent were black; approximately 18 percent were white; and approximately 20 percent were American Indians, Mexican Americans, Puerto Ricans, and Orientals. More UB students were females (56 percent) than males. Approximately 85 percent of the students were 16 to 18 years of age; and approximately 15, 39, and 45 percent were in grades 10, 11, and 12, respectively. It should be noted here that although projects have staff of the same ethnicity as the students, project staff proportions, by ethnicity or sex, do not match student proportions. For example, 47 percent of the project directors, and about 33 percent of instructors and counselors, were black; 34 percent of project directors, 55 percent of instructors, and 42 percent of counselors were white. Although Native American and Mexican American project directors appeared in about the same proportions (19 percent) as students of similar ethnicity, only about 10 percent of the instructors were in these categories; counselors in these ethnic categories represented about 24 percent of the population of counselors, but of that only about 3 percent were Native American. Only one Oriental (an instructor) appeared in the sample of 286 staff members responding. Almost 90 percent of project directors, and about 55 percent of the counselors and instructors, were male.

Based on ninth grade academic information, slightly more than half of the UB students were classified as being "academic risks." Also, slightly less than half had been enrolled in a general course of study in the ninth grade, about one-third had been enrolled in an academic curriculum, and only 10 percent had been enrolled in a vocational/business course of study. With regard, however, to the definition and interpretation of "academic risk" or the promise of academic attainment following program participation, much fuzziness and potential variability exists. Project staff tended to rely on school recommendations and personal intuitions, variously formed, in selecting the relatively small numbers of students among applicants or potential applicants that could be accommodated. Low motivation and relatively low grades were frequently cited as a basis for selection, yet some project staff reported seeking students with clear evidence of high motivation and tolerated high academic performance if the low income criterion was met. The lack of operational specificity in the definition of the target group not only interjects difficulties in accounting for input and process interactions, but also reinforces the supposition that different programs do (or should do) different things if their students are to be properly facilitated.

Using an index that is closely related to, but not identical to, federal poverty level guidelines, approximately two-thirds of the UB students were considered to be at or below poverty level. Roughly one-half the parents of UB students had attained a formal education equivalent to or greater than a high school degree. Less than 5 percent of the parents had as much as a 4-year college education. The majority of fathers were laborers or service workers; the majority of mothers were either homemakers, laborers, or service workers. Approximately 5 percent of the UB students had also participated in a Talent Search (TS) Program. Slightly over half of the UB students reported no participation in other intervention programs (exclusive of TS and UB).

Directors, instructors, and counselors showed a high degree of similarity in their ratings of the UB students in their project. All three perceived UB students to be most proficient in peer relations and creativity. Student general academic ability was rated to be above average by all staff categories. The lowest ratings were given to student attitudes toward authority and toward school; but student attitude toward life was rated quite high. The students' self-concept and attention span were also rated poor.

In summary: although the program appears to contain a majority of the kinds of students for which it is intended with regard to poverty criteria (and perhaps with regard to ethnicity), the definition of the target group with regard to academic achievement potential (or to nature of detriment to academic achievement, other than poverty status) appears to vary as a matter of its inherent lack of specificity, operational feasibility, or differences in interpretation among staff in various projects. Some of the differences found (e.g., projects deliberately recruiting highly motivated, but perhaps otherwise disadvantaged students) may represent a desirable heterogeneity, but this heterogeneity appears to result from variability in personal convictions or preferences of project staff or lack of a manageable degree of preciseness in the definitions of target group in the legislation or in the guidelines. This is not to state, however, that ineligible or undeserving students are being served, but that a variety of kinds of disadvantagement are probably now (haphazardly) represented.

E. Project Activities and Services

A wide range of courses and classes, tutoring and counseling services, sports, social and cultural activities, and medical and dental services were offered by projects during both the summer and academic year programs. Tutoring and counseling services were generally offered by all projects during both sessions, but there was greater variability in availability of other activities. The greatest variation occurred in the availability of sports and specific types of courses. A greater variety of courses seemed to be available during the summer program than during the academic year. During the academic year, a greater number of projects offered counseling and other assistance concerned with the more immediate needs of obtaining jobs than were offered during the summer program. The two functions rated (whether by directors, instructors, or counselors) as being the most emphasized during both summer and academic year sessions were tutoring/remedial instruction and counseling. Cultural enrichment activities during the summer and community and school liaison work during the academic year were the third most emphasized functions.

Project staff questionnaire responses are consistent with site-visit observations of the programmatic differences between the academic year and summer sessions. During the academic year, some students experienced a program consisting of irregular meetings concerned mostly with counseling; others experienced a series of weekly meetings involving counseling, tutoring, and formalized classes. Some projects devote considerable time to applying for college admission and financial aid, others place much less emphasis on this matter. In short, the academic year program activities appear to vary markedly from project to project.

Project summer programs, on the other hand, are much more likely to provide a common set of experiences; i.e., 6 weeks of formal classes, recreation, extensive counseling and tutoring, cultural activities, and exposure to the wider world of the host institution. At the same time, there were important differences in the degree of structure in the summer program. Some programs were highly structured and offered students little freedom in choosing course options; others were quite laissez faire in their approach to students' selection of courses, class attendance, and followthrough on academic and other responsibilities.

Given a list of 32 specified UB activities and services, UB students indicated those activities which were available and those in which they participated. Additionally, they rated the degree to which they were helped by each of the activities in which they participated. With few exceptions all the listed courses and services were available to at least two-thirds of the students. Courses generally available to all but a few students (15 percent or less) included: basic subjects such as reading, remedial English, English, remedial mathematics, and mathematics. Counseling services and other activities related to entry into postsecondary education, and such cultural enrichment activities as sports, social gatherings, and cultural events were also reported to be generally available.

The activities most commonly available to most UB students were also characterized by the highest participation rates (among those students for whom the activities had been available) and were considered to be the most helpful (among the students who had participated). The common availability, participation, and reported helpfulness of these activities support the reports of staff members that tutoring or remedial instruction, counseling, and cultural enrichment are three of the most emphasized and valued functions in the UB program. At the same time, a minority of students, sometimes reaching substantial proportions and seldom dropping below 10 percent, rated the activities as "of little or no help to me." The activities more frequently perceived as of little help included: help in finding jobs (33 percent so rating this activity); art or music courses (25 percent); tutoring by other students in the program (27 percent); individual counseling on personal problems (19 percent); counseling on choice of career (17 percent); or courses in learning how to study (17 percent). These reactions may be based, of course, on differential student need or interest or on differential effectiveness of the function in meeting the needs it was designed to serve.

In summary: although the overall program exhibits considerable variability--particularly in the academic year component--UB seems to be effective in providing and delivering the basic activities required by the guidelines. At the same time, not all students find all project activities helpful (as might be expected), with one-quarter or more finding vocational placement, counseling on personal problems, fine art courses, or tutoring by other UB students to be of little or no help.

F. Staff Rating of Teaching Behaviors and Educational Goals

There was an extremely high degree of agreement and similarity in the ratings of educational goals by project directors, counselors, and instructors.

In general, the staff agreed that the more important goals of education were developing student enthusiasm for learning, helping students to feel important, and providing students with a solid grasp of fundamental skills. Lowest ratings were given to the goals of developing language skills in English for the students from non-English speaking backgrounds, and increasing student effectiveness in dealing with authority figures.

Instructors rated the following behaviors to be most important in their teaching: encouraging students to become involved; giving students praise and affection; answering student questions; encouraging students to make choices; talking with students; and diagnosing individual learning problems. Considered to be of less importance were the use of disciplinary measures, working with parents, establishing a clear time structure, and using rewards to shape behavior. These ratings of the importance of teaching behaviors were generally congruent with the instructors' ratings of educational goals.

G. Student Evaluations of UB Projects

UB students rated the quality of 15 instructional and/or operational aspects of their projects (curriculum content, quality of administration, and staff and student interrelationships) separately for the academic year and summer programs. Although the rating patterns were similar, the average ratings of academic year program were slightly lower than that of comparable elements in the summer program. In general, project aspects were rated as quite good for both sessions; however, some project elements were rated no better than "fair" by substantial proportions (from 10 to 45 percent) of students. Most frequently in this latter category were amount of student stipend, participation by parents, or student-directed discipline activity.

Students perceived the UB program's central functions such as day-to-day operations of teaching, counseling, and administration (including discipline) to be well conducted and organized. They considered the best qualities of the program to be the staff's interest in the students and the harmonious relationships that existed among the staff and among the students. They also prized highly the staff's willingness to accept student suggestions. Interviews with students during the site visits generally confirmed the student questionnaire responses. The students interviewed were generally enthusiastic about project activities, appreciative of the opportunity to "learn and still have a good time," and generally expressed particular loyalty to the UB project and its staff. They also expressed a more favorable reaction to the summer component than to the academic year component.

Of the potential benefits attainable from UB participation, students rated gaining a better understanding of the need for education and being prepared to gain admission to college or other types of schools as being most important. Personal development and interpersonal growth were seen as next most important. The potential benefits regarded as being less important were: having a change from the routine of regular school, making close friends, participating in extracurricular activities, and obtaining financial aid for medical services and other needs beyond the UB stipend. Importance of the potential benefits is, however, a relative concept, and even for the least important benefit substantial proportions of students felt it very important.

In general, the degree to which each potential benefit was perceived as important was directly related to the extent to which the benefit had been received. There were, however, some deviations from this trend--the most marked of which was the considerable proportion of students who viewed as important the benefits of learning better study skills and becoming better prepared for postsecondary education but who reported receiving the benefits to only a moderate degree.

With one exception, a plurality of students indicated that no changes had been perceived in the way "significant others" had changed their opinions about them as a result of their participation in UB. The exception involved parents, and approximately 55 percent of the students felt that their parents thought more highly of them because of their participation in UB. Of those students reporting changes in the opinions of others, substantially higher proportions indicated positive rather than negative change (students indicating negative change were in the 1 to 3 percent range, while those indicating positive change were in the 27 to 39 percent range).

In summary: students involved in the UB projects appear positive about the staff and their program experience. The quality of the curriculum, of counseling and tutoring, and of overall administration is perceived as quite high, as is the pattern of staff and student interrelationships. The self-reports of the students strongly suggest that they are incorporating program objectives into their own behavior, self-concept, and aspirations.

H. Relations with Host Institutions and Other Supporting Groups

In general, UB staff reported receiving moderately effective support from their host institutions, their advisory committees, and other parent and community groups. The staff and students reported good relationships internally among staff and students, suggesting that in most projects the directors, staff, and students formed a highly cohesive group. Practically all project directors reported the existence of a Parent Advisory Committee; while approximately half reported the existence of a Community Resources Committee. Nearly all projects with the specified committees reported meeting at least twice a year, with a majority holding meetings at least four times a year.

Amost 90 percent of the project directors rated their host institutions (primarily public and private colleges and universities) as being supportive, but no host institution was seen as unsupportive. Evidence of host institution support and commitment to specified projects, and to the UB concept in general, was also obtained in site visits. Host institutions at most visited sites gave faculty or administrative status to project directors; many included their regular instructors in the summer program; and, virtually all made the programs and facilities of the institution available to UB students on an equal basis with the regular student body.

The majority of UB host institutions also administered other programs for the disadvantaged. About half administered Special Services projects; and approximately 15 percent administered Talent Search projects. Most project directors also reported that other programs for the disadvantaged, that were not administered by their host institutions, operated in the same area. Other UB projects operated in the area of about half the reporting projects. Other programs reported as operating in their area by over half of UB directors were Talent Search, Special Services, Neighborhood Youth Corps, High School Work Study, Veterans Programs, and High School Equivalency Programs.

Most project directors reported cooperative relationships with these other programs in their areas. UB instructors and counselors also reported receiving a high degree of cooperation from high schools and postsecondary institutions. This high degree of cooperation is extremely important because UB projects typically depend on: (1) high schools for recruiting students, writing information about the student's school performance, and developing complementary programs of study for students; and (2) postsecondary institutions for processing UB participant applications, granting admission, administering financial aid, and providing for the needs of students in the institutions.

Many project directors interviewed during site visits felt the need for more assistance, monitoring, feedback, and direction than they were currently receiving from the national and regional offices of USOE. A special concern common across projects and regions was the timing of notification of funding and consequent late funding.

In summary: the projects appear to be very much at home with, and an integral and accepted part of, their host institutions; they appear effective in utilizing other facilitating instrumentations provided by the institutions and communities. They would generally like more contact with, and direction and assistance from, the national and regional offices of USOE.

III. SUMMARY AND INTERPRETATION OF MAJOR FINDINGS: ATTAINMENT OF BASIC UB OBJECTIVES

To evaluate the attainment of basic UB objectives, a series of analyses were focused on comparative student outcomes for the populations of UB participants and comparison students, or for certain subgroups thereof. Differences between these populations on such factors as grade level, sex, race, academic risk, poverty status, and general region, state, district, or school-specific educational environments were reduced by the sample design or by a posteriori statistical equalization of the two groups. After balancing, the UB and comparison student populations were, in general, quite comparable. Thus, it is reasonable to assume that any differences in outcome measures between the two populations are primarily related to UB participation.

A. Increasing High School Retention

Two types of HS continuance/completion rates were analyzed. The first was a fall-to-spring (within-school-year) rate; the second a fall-to-fall (full-year) rate. The latter rate takes into consideration those students who drop out in the summer vacation between the academic years.

The fall-to-spring HS continuance/completion rate within each of grade levels 10, 11, and 12 is higher for the UB group than for the comparison group, but the observed differences are statistically significant only for grades 10 and 11. Regardless of grade level considered, however, continuance/completion rates for both groups were quite high, ranging from 93 to 98 percent. Within the UB group, completion rates for twelfth graders tended to increase with the length of time students had spent in the UB program.

The fall-to-fall HS continuance/completion rate picture is somewhat different. As expected, the fall-to-fall rates are lower for both groups, ranging from 85 to 93 percent. The only statistically significant rate difference was for grade 10, in which the UB students showed higher rates (93 percent vs. 86 percent for the control group). Further, the fall-to-fall rate does not appear to be related to the extent of UB participation. A Markov model for educational continuance, using the synthetic cohort feature of the study design, indicated that the probability of twelfth grade completion, given tenth grade entry, is not significantly related to UB participation, regardless of the extent of that participation.

Based on these analyses, there is little evidence to support the hypothesis that the UB program is significantly increasing high school retention among its participants. On the other hand, the extent of high school dropout is at a relatively limited level on a year-by-year basis, although the cumulative impact over the last 3 high school years is estimated to approach 30 percent for UB or similar students.

B. Increasing the Rate of Entry Into PSE

The most important objective--and the basic mandate of the enabling legislation--is to improve the numbers of "disadvantaged" students who enter postsecondary education. The differences in PSE enrollment rates between the UB and comparison students were found to be both statistically and practically significant due to their absolute magnitude--and to be in favor of the UB program. Among high school graduates, less than half of the comparison students entered PSE as compared to almost three-fourths of the UB participants. Among all individuals who could have entered PSE (i.e., those not still in HS, including high school dropouts), the data indicate that 13 of 20 UB students entered PSE as compared to 8 of 20 comparison students. There is also statistical evidence that among HS graduates PSE entry rate is positively related to length of participation in the UB program, although the absolute magnitude of the increase is less than 10 percent.

Although the stated objective does not specify placement in any particular type of postsecondary institution, most UB students apply to and enter 4-year institutions. Of those UB students entering postsecondary institutions, about 75 percent enrolled in 4-year colleges or universities and about 20 percent entered 2-year junior or community colleges. The remaining students entered vocational, trade, or other schools. Comparable figures for the entering comparison students were about 45, 30, and 25 percent, respectively.

Given these results, it appears that UB participation is positively related to immediate entry into postsecondary education, in both a qualitative and quantitative sense. The most plausible explanation for this relationship (though not the only one) is that UB program participation, *per se*, significantly raises the probability of student entry into PSE. It should be noted, however, that the data in this study do not allow an assessment of postsecondary persistence within the two groups, nor do they allow examination of hypotheses regarding entry into PSE a year or more after graduation.

C. Generating Skills and Motivation Necessary for Success in Education Beyond High School

The extent to which UB is meeting this objective could not be directly and rigorously evaluated due to the difficulty in defining and/or measuring such variables in an essentially cross-sectional study. An indirect evaluation was conducted, however, by examining differences between the UB and comparison students on factors theoretically and empirically related to success in postsecondary education. Specifically examined were changes that occurred in: high school academic measures from ninth grade to current grade (grade point average, proportion of academic credits taken, and academic credits passed); aspirations and expectations for postsecondary education; and actions taken in preparation for postsecondary education.

There is no support for a relationship between UB participation and change in academic factors. There is evidence, however, that greater proportions of UB participants planned and expected to attend and complete PSE. There is also evidence to support the hypothesis that the UB program is facilitating actions taken by students in preparation for PSE, including application. The data further indicate that proportionally more UB applicants to PSE institutions apply for financial aid than do equivalent groups of comparison students; and that while UB aid applicants do not receive more offers of aid, they do receive more adequate offers (generally in the form of larger grants).

The overall thrust of these results suggests that the UB program is providing supportive, advocacy, and advisory services that facilitate entrance into PSE. Considering the limitations of much of the data used to produce the results reported in this subsection (e.g., the questionable nature of the particular measures used and the attenuation of data due to large amounts of indeterminate responses and/or a small number of cases), these results are less reliable than those involving HS continuance or PSE entry; however, they support and help to explain the higher PSE entry rates found for UB program students.

IV. SUMMARY AND INTERPRETATIONS OF MAJOR FINDINGS: THE RELATIONSHIPS OF STUDENT OUTCOMES TO PROJECT CHARACTERISTICS

Sample data were explored in an attempt to establish relationships of specific project functional and structural characteristics with student outcome measures. The statistical methods of multiple discriminant analysis and multiple regression analysis were used in these exploratory analyses. One general theme was reflected in the majority of analyses: the preprocess characteristics of the students served by a project were consistently related to project level outcomes as measured in this study; however, when student preprocess differences were controlled, there remained, at best, weak relationships between project process measures and project level outcomes. The relevant student characteristics include: ninth grade GPA and academic course load, the proportion of poverty level students in the project, the number of students in the project, the percent of male students, and the proportions of students who were juniors and seniors. The basic finding suggests that the higher the level of input (e.g., higher ninth grade GPA, lower proportions of academic risk students), the more likely the project was to achieve the basic goal of inducing or experiencing high PSE entry rates. This relationship does not provide any useful information for program-level decisionmaking, since any project can determine, through selection procedures, the academic quality of participants (within the constraints of the program guidelines).

There was one small but relatively consistent hint of a relationship between a few academic year activities and the outcome measures considered. The pattern of this weak finding is suggestive of a possible relationship between level of academic year program activity and student outcomes. There are, however, other plausible explanations of this pattern.

Other relationships between program process and output measures did not appear stable, consistent, or conceptually reasonable. The most predictive relationships between process measures and the individual student outcomes were given by models that were qualitatively different. Such a lack of internal consistency is especially disconcerting in a case such as this in which many of the output measures are conceptually similar and correlated. Further, the partial correlations between student outcomes and some project characteristics were negative, suggesting counterintuitive relationships such as that of project emphasis on academic counseling being associated with lower postsecondary entry rates. Given that one of the dangers of the stepwise analysis techniques used is that they capitalize on chance sampling fluctuations, the inconsistent relationships were dismissed as artifactual.

The failure to discover any systematic set of project characteristics that were related to project success is disturbing and counterintuitive, particularly in light of the latitude allowed in these analyses. It could be that such relationships do not exist, although such an interpretation is illogical. On the other hand, lack of observed relationship could be attributed to many other causes--measurement error, inappropriate choice of variables, or inappropriate analysis models, to name but a few. One reasonable explanation is that measurement error and relative pervasive relationships between input and output jointly mask any existing relationships between process and output. If this is the case, then either the relationships are relatively weak or the measurement error is large, or both.

Another possible explanation of this pattern of negative findings (and one that is supported by observations during site visits) is that input measures and process measures are confounded. That is, different processes are used because different types of students are selected, and different students are selected because a program has geared its process to that particular type of student. With this type of confounding, statistical adjustments for input differences, such as those used in these analyses, would tend to wash out any effects due to process. This explanation is quite consistent with the study findings, but to investigate the hypothesis more fully would require different approaches to both design and measurement than those employed in this study.